SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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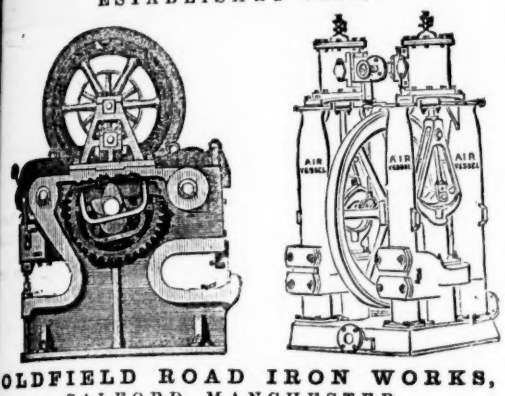

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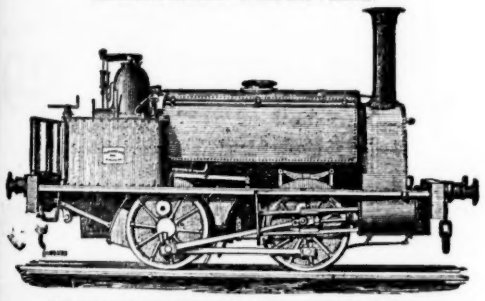

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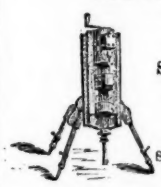

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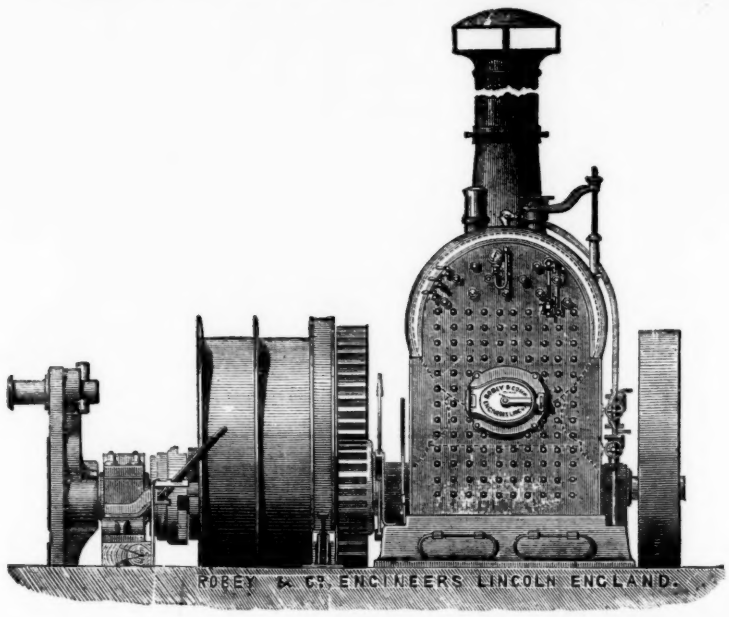

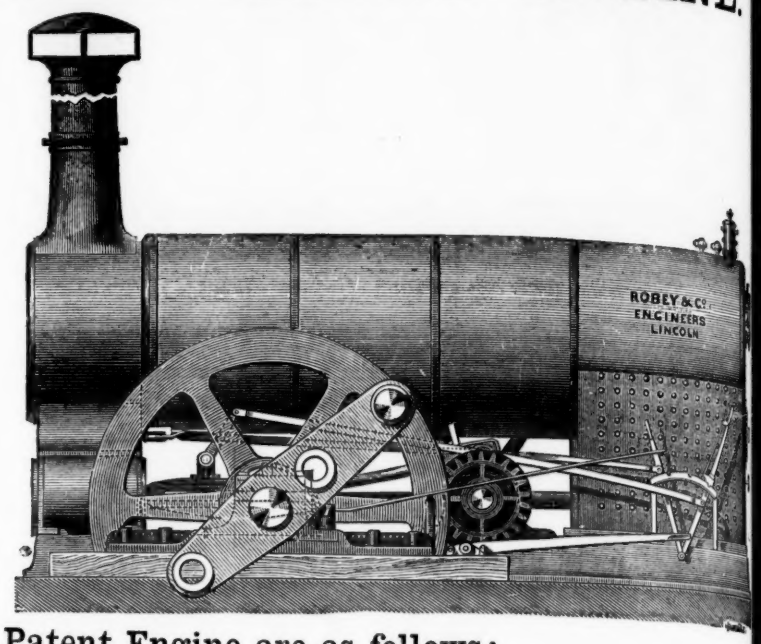

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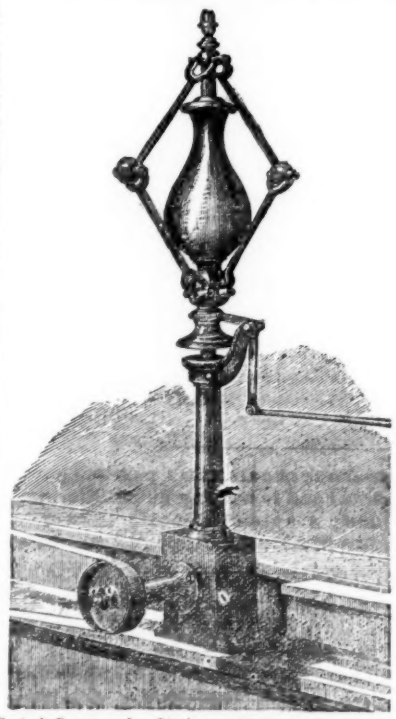

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SANDWELL, HAMSTEAD, AND PERRY NEW SINKINGS.

These were all inspected on Tuesday by the Dudley and Midland Geological Society and Field Club, of whom Mr. COCHRANE is the president and Mr. E. B. MARTEN the hon. secretary. These gentlemen on that day headed a numerous following. At the famous Sandwell Colliery they were received by Mr. HENRY JOHNSON, the engineer of the company, to whom, indeed, Sandwell Colliery is due, and by his son. Mr. JOHNSON took charge of the party upon the surface, and his son conducted the geologists through the splendid roadways which at ½ mile from the surface go out in all directions from the bottom of the two shafts, which are one of 10 ft. and the other of 15 ft. diameter. These workings, together with the drawing machinery, have been already described in the *Mining Journal*. When the surface had been again reached the visitors assembled in the engine-house, and Mr. JOHNSON delivered an address of great interest touching upon what had been done by the late Earl of DARTMOUTH, with whom he was himself at the time associated, and what had now been done, with, happily, very different results, by the Sandwell Park Company.

Mr. JOHNSON very gracefully acknowledged his indebtedness to the society, whose members he was then addressing, for much information upon geological facts which he possessed. To that information the Sandwell Park Colliery Company was in main part due, for it again and again inspired him with confidence when he was working almost single-handed in searching for the valuable property which he ultimately found, and which his audience had just inspected. In sketching the history of Sandwell he would carry them back to the starting of the Heath Pit, which was begun in 1842. In 1848 he became a director of that colliery, which was what was locally termed a one-eyed pit, coal of much value being found only on one side. He set himself to make enquiries of the old workmen who had explored in the direction of Birmingham; and ultimately he came to the conclusion that there was no coal in the direction of that great town; and it was so set forth by the late J. BEETE JUKES in his Geological Memoirs of South Staffordshire. They would see, however, upon what his information was based. But by-and-bye coal got scarcer, and knowle lge upon the science of geology increased. He then came to the conclusion that it would be well there should be a trial sinking in the ground which at the earlier date he feared was empty of coal. Having arranged with the Earl of Dartmouth for a low royalty, he asked the public for 20,000*l.* to conduct proving operations. In a few days the money was forthcoming, and in June, 1873, the Thick coal was found. Very varied, however, were the features which presented themselves and the prospects which seemed to lie before them ere this happy discovery was realised. Pointing to an excellent diagram showing the formation which had been gone through up to the time of the reaching of the Thick coal, Mr. JOHNSON described how they had passed through first yellow drift, which contained remnants of Carradock limestone, brought evidently from Walsall when the water courses ran in exactly opposite directions to that in which they were now running, then went on to show how the concretionary limestone was subsequently passed, afterwards what was generally thought to be the Permians, but which he was highly inclined to believe were really the coal measures, he brought the sinking down to some highly calcareous ground. This evidence led him to the conclusion that he was now beneath where coal was likely to be found, and that if coal had existed above it had been swept away.

So greatly was his faith at that time shaken in the prospects of the future that he offered the whole of his interest in the undertaking for 40*l.*, and to such an extent did the directors share his views that not one of them had pluck enough to say "JOHNSON, I will give it you." Despairing though they were they continued their work, at one time sinking, at another time boring. Presently they came down upon some blood-red ground, and then upon some rock, filled with little pillules of oxide of iron. When, however, he came to wash it he found it was white sandstone. At this he was greatly encouraged, and recommenced sinking. By-and-bye they came upon the conglomerate which lies above the brooch in six or seven pits of which he had knowledge. Then they found fossils of a class which many years ago his son had collected for him upon spots which were subsequently found to overlie the brooch. At this stage he and his soon took heart and went on cheerfully, till their doubts were almost wholly removed by getting into what was known in South Staffordshire as the herringstone. Presently they arrived at a very critical point when success began to appear. His hearers might imagine with what interest he sat one night in the pit hovel and every quarter-of-an-hour received bulletins from the workmen who had struck the coal, and ultimately went through the first seam, which they found to be 6 yards 2 feet 6 inches in thickness. This was followed with the finding of the Heathen coal and the gubbing and white ironstone—stone of a quality which he had not seen surpassed anywhere in Staffordshire, and to which he especially directed the attention of the geologists who were experienced in these formations. They had now 2268 yards of exploring gateway driven out, and the Thick coal was found throughout of the average thickness of 8 yards. The surface estate running from Newton-road to Smethwick was 2½ miles in length, and from the old church at West Bromwich to Bullock's Farm was 2½ miles in breadth. The estate comprised 1700 acres. Next to it in one direction came the Hamstead Colliery with its 500 acres, and nearer to Birmingham the Perry Colliery with its 1000 acres. One of the roads had been driven out a length of 1000 yards, and they were only waiting for extra engine power to continue the work in that direction to the limit of the property. He believed that they should find the coal extending right up to the Hamstead estate, and he hoped that Hamstead and Perry would meet with as good luck as had attended Sandwell.

On the motion of Mr. COCHRANE, Mr. JOHNSON was very warmly thanked for his address, and Mr. JOHNSON in acknowledging the compliment, and in inviting his visitors to luncheon, replied to some questions by members of the Society, and stated that he had found no indications of the giving out of the coal, and that the dislocations were only those which were common in the district, arising out of the at one time horizontal measures having been forced into a slanting position.

When the geologists had partaken of Mr. JOHNSON's hospitality, they proceeded in the vehicles which had been provided for the purpose to the Hamstead sinkings, which are being conducted by Messrs. PEACOCK and SMALLMAN, the joint engineers of the company. Here one pit, begun in July, 1875, has been driven to a depth of 101 yards, and another to a depth of 40 yards. The greater depth is likely to prove pretty much the limit of the water-bearing strata. Both pits are being connected by boring from the shallower and the water is being pumped up from the greater depth. The shafts are now 21 ft. diameter, but by first a casing of bricks, then a good lining of puddled clay, and ultimately the smaller brick lining, the shafts will be reduced to a working dimension of 15 ft. This process of coffering was going on when the place was inspected. Until the water-bearing strata have been passed through, the progress will not be rapid, but the work is being well done. Thus far no indications of coal have been come upon. Every evidence, however, corresponds with the evidences at similar depths on the Sandwell estate. During a discussion as to the probable depth to which the company will have to go before they strike—if they at all strike—the coal of which they are in search, Mr. MARTEN expressed an opinion that coal would be found at 500 yards. but Mr. JOHNSON, who had accompanied the party from Sandwell, considered it to be impossible to predict with confidence at what depth the fuel would be found; if rocks were absent so much the better for the Hamstead Company.

The new sinkings of the Perry Colliery Company were now driven to, and inspected by the visitors. Messrs. BAILEY, the engineers, were in attendance, and a short paper upon the sinkings was read by Mr. THOMAS HENRY BAILEY. Five months ago a shaft 20 ft. 4 in. in diameter was commenced to be sunk, but much difficulty arose from the nature of the ground, which was principally gravel and sand, and also from water, which flowed in freely. At this time only temporary pumping machinery was getting rid of the water, and as it appeared to be very uncertain to what extent the water might increase as the work proceeded, at a depth of 17 yards operations were suspended. It was now resolved that powerful pumping machinery should be laid down, and a horizontal high-pressure steam-engine, having a 33-in. cylinder and a 5-ft. stroke, fed by two Lancashire steam boilers 30 ft. by 7 ft., was erected. This machinery the party inspected, and it was explained that by its aid a distance of some 70 yards had now been sunk. For 50 yards the diameter with which the sinking was begun was maintained, at which point a foundation free from water was come upon. Throughout these 50 yards it is proposed to coffer, which will prevent any of the surface water to that depth from interfering with the work. Gravel, sand, and drift composed the strata passed through for about the first 10 yards, and below this a series of red rocks and marls were found alternating. The rock predominated. The strata in which the sinkings are now being conducted were so sharp, Mr. BAILEY informed the party, that the leather on the buckets was destroyed in about six hours, and to obviate this difficulty gutta percha had to a great extent to be adopted. The great quantity of quartz in the strata was, the President thought, the cause of this mischief. The opinion of the geologists present as to the probable depth, and also the character, of the strata which would have to be sunk through before fuel was reached, was sought. Preliminary arrangements for railway sidings, workshops, and the like, necessary for the carrying out of such a concern as the Perry Colliery Company hopes at one day to become, have been entered into, and the engineers of the colliery hoped that coal itself would be struck by the time the Dudley Geological and Scientific Society next visited them.

Much interest was taken at Sandwell by practical men in the inspection of a pit wagon frame which has been patented by Mr. JOHNSON, jun., and which is there in use. The invention is of wrought-iron, stamped out of a heavy plate, and having attached to it self-lubricating axle-boxes of cast-iron, which with one feeding will keep the axles moist for a month. The lubricators are cast hollow, with a small hole to convey the oil to the axle, and a needle is inserted in the hole to preserve the oil from external impediment. The bracket is cast with a closed top, so that no oil can escape. The lubricant is put in through an opening in the side of the lubricator, and the opening is stopped by a screw plug. The ends of the framework are turned up to receive the wagon buffers, and instead of the old drawbar there is a lug formed by the turning back of a part of the framework, and in this lug the drawing ring is secured. The framework fitted with the lubricating axle-boxes is an immense improvement upon the timber frames and drawbars and axle-boxes of the ordinary pit wagon; and a well-made plate-iron frame like that in use at Sandwell should be capable of wearing out any half-dozen wrought-iron wagons, yet to all the frame would be applicable.

THE ARUBA ISLAND GOLD MINING COMPANY—No. III.

SIR,—The misfortunes of this company grew out of the misrepresentations in regard to the value of the gold ores. It has been my aim to fix this wrong upon the one who, by his profession of "superintendent and mining engineer," obtained a confidence which he has abused. In doing this I have had in view also the protection of the company from a further dependence upon estimates, statements, or services which have hitherto proved so misleading and unprofitable. In dismissing this consideration I am free to admit that the present board may have acted simply according to precedent, and unadvisedly through inexperience when they accepted facts and information only from one whom they unwittingly assumed to be a competent authority. Holding, as I do, that this company possesses a mining concession of extraordinary advantage and value, I ask the great favour to publish in the *Mining Journal* a condensed review of the Island of Aruba, especially with reference to its great importance as an isolated mining district solely under the control of this company.—*York street, Sept.* 11. G. W. BAKER.

THE ISLAND OF ARUBA.—Aruba Island, a possession of Holland, lies west of Curaçoa. in lat. 12·30 N., long. 70 W., some 12 miles distant from the peninsula of Paraguana, a part of Venezuela extending into the Gulf Maracaybo. The south-east end is distant from the western point of Curaçoa about 30 or 35 miles. In extent it is said to be 30 miles long by 7 miles at its widest part. The population numbers some 4000 or 5000, the larger portion occupying the port town Orange Stadt. Distributed over the island are numerous small plots of ground cleared and cultivated in a very primitive manner. Here and there a number of huts or houses constitute a village, in one or two of which there is a Catholic chapel, a priest, and perhaps a school-room. Orange Stadt occupies a level space on the leeward side of the island, from which a line extending north, to the windward side, would divide the island unequally, two thirds lying east and one-third west. The plateau upon which the town is built is mostly covered with a limestone pavement, superimposed upon a sandy soil, the work of the ocean, from the waters of which this concrete was furnished by precipitation in the course of countless ages. The same character of pavement is to be observed for the most part along the whole leeward coast, most notably for several miles on the way to the south-east end. The water line is almost entirely a bulkhead of like precipitations, imbedding lumps and fragments of coral limestone. On this, the leeward, side there is first a somewhat narrow strip of pretty shallow water running co-extensively with the entire shore line. Outwardly this shallow water is bounded by a coral reef, a rim extending above the water level, with here and there a low growth of scrubby wood and seaweed. Two or three breaks occur in this reef, one of which permits small craft an entrance into the quiet waters of the port town. The windward, or northern, shore is a rugged and irregular coral and ocean-built buttress or bulkhead, beachless, deep water existing only a few feet from the surf line. For the most part the mountains on the northern side of the island reach to the water, but where there is an opening or stretch of level land a like concrete pavement as on the south side is formed superficially nearly a foot in thickness, and extending inland to a considerable distance. This is notably the case at Bushiribana. The spray of the surf incessantly carried inland by the wind keeps the surface wet with water holding minute quantities of carbonate of lime in solution, derived, I presume, from the agglutinated skeletons of dead polypi, which is then precipitated by contact with the carbonic acid present in the air, the result being an excessively slow formation of a cemented and hard calcareous rock, exceedingly rough pitted and jagged on its surface. This same concrete or cemented pavement is to be observed on elevations inland, 100 feet or more above the present sea level. The larger portion of the third part of the island lying west of the line heretofore suggested may be termed level land, covered as to vegetation, where not under cultivation, with a scrubby growth of trees entirely valueless, excepting the divi-divi, with the common cactus as an undergrowth almost impenetrable, and in groves or forests, some of the cactus trees being a foot or more in diameter, the leafless spikes of which extend upwards 40 or 50 ft. The lesser part of the other two thirds of the island may also be termed level, and of the same general character. The tropical fruits grow but scantily on the island, by reason of the drought existing throughout most of the year. At the west end, and at La Fontaine, the latter possessing the only running stream on the island, the banana, the mesper, the lime, and some other fruits are grown. The date tree is rare, and I think fruitless. Cocoanut groves exist in several parts of the island. Flowering plants are to be seen only during the wet season, when the island suddenly changes from the appearance of a sterile, arid, and gloomy waste into the blooming magnificence of tropical vegetation. More than one-third of the island is rugged and mountainous. The level portions are here and there dotted with mounds or bunches of rocks, and immense boulders of granite, a single one often standing alone, somewhat rounded by the chipping action of the elements, and some 20 ft. or more in diameter. The sides of the mountains are most frequently a bewildering wreck of granite rock, riven in huge masses and tossed about in confusion, the tops often accessible only by hazardous climbing. The west end is tongue-shaped, and mostly a level sand plateau, with a few bunches or mound like elevations. Centrally, ½ mile or so from the surf, an abrupt buttress of rock is observed, once evidently the sea-wall, at the top of which, now more than 50 ft. above the water level, the surf dashed in a far bygone age. A ridge extends eastward from this, expands and flattens down to rise again into several hills, mostly on the north side. The eastern slope of these hills is lost in a level sweep of land or valley, from any part of which the ocean on either hand is visible. Eastward of this sweep the mountain system of the west part of the island properly commences, the highest elevations are near the northern shore. Excepting a single high ridge, the elevations are at first irregular hummocks and low hills, presently growing into more lofty protuberances, the arbitrary and unsystematic contour of rugged mountains, and assuming the meridional direction, the trend being generally from west to east. The capricious twistings and crumplings, the dark looking walls and huge broken and rounded masses suffice to indicate the formation to belong to the "transition system," in which the granite is interchangeable with trap, basalt, serpentine greenstone, trachytes, and slate. This chain of mountains continues along the northern side, expanding somewhat before reaching Bushiribana, where it may be said to terminate somewhat abruptly. Both transverse and longitudinal valleys, canyons, or gulches are to be observed, the most of them easily traversed, but generally short and narrow. Bushiribana, the location of the present works of the company, is a level area of some hundreds of acres, having an open sea view to the north, the swell of the ocean dashing against an almost perpendicular limestone and coral wall, furnishing a picturesque view of a broken and angry surf for a mile and more in extent. From here an excellent road has been made to the town, some 5 miles distant. Going southerly you pass into one of two basin-like areas strewn with granite boulders. They seem to be divided by a low rim of rocky ridges interiorly, the outer rim of the most western one being composed of detached mounds or hills, only one of which can be termed a mountain, this is a cone almost alone, and some 600 ft. high. The eastern rim is constituted of a chain of mountains, of which Arikok is the highest, some 550 feet high. The tops and sides of these are mostly less rugged than the lower ridges within the basins. For the most part they can be ridden over on horseback; they are nearly without trees here, and only a stunted growth. The cactus abounds, however, on the sides, and a short coarse grass covers the ground where the absence of sand and stones permits its growth. Twisting and narrow roois or gulches branch off in all directions from several main channels which go down to the coast. One of these, the Rooi Fluit, is famous for the production of gold. Rools Chichi and Chete are also of importance in this respect. This most extensive system of mountains commences at Bushiribana to the east, and very speedily covers the whole width of the island, encompassing the basins and extending down to the Serro Colorado at the south-eastern end. On the south or lee side the decline is gradual, whilst on the north the slope is sudden and sometimes precipitous at the water line. Within a mile or so from La Fontaine something like an extended beach appears. Examination shows this to be that part of the land last raised out of the ocean. Its sea boundary is the wall or bulkhead in deep water against which the swell of the ocean breaks, no billows overflow it, nor is it wetted by the tides. Inland, several hundred yards from the present sea wall stands an ancient sea wall 100 ft. high, a dark rugged cavernous mass of calcareous cement and coral remains extending miles down to the south east end. When the ocean beat against this wall, as it does against the present barrier, this seeming beach was deep under water. The remains of another flat and still older sea wall further inland and higher up are still visible, whilst back of the high bluff at the extreme point of the island, and perhaps more than 100 ft. above the present sea level, you must ride over an ancient limestone pavement which yet covers a large area. When this pavement was in process of formation the ocean must have nearly covered the bluff, and the surf line was coincident with the top of the old inland sea wall. The remains of a still more ancient pavement is yet visible higher up, contemporaneous with that oldest sea wall to which allusion has been made. The slow emergence of the island out of the ocean is thus plainly demonstrable.

INDUSTRY, CHARACTERISTICS, GOVERNMENT, &c.—The industrial products of the island have but little importance beyond the sustenance of the inhabitants. The pursuit of agriculture is mainly confined to growing maize, which is planted and harvested during the rainy season. An occasional prolonging of this growing season facilitates the raising of two and sometimes three crops, whereby sufficient provision is laid by to ensure against starvation in years of drought. The leaves of the divi divi tree are limitedly gathered and dried for exportation. The aloe plant is somewhat cultivated in a commercial way; besides these the hides of goats, sheep, and a few small cattle add to the exportable products, some few of the two former being shipped occasionally with chickens, fish, and fruit in good seasons. The climate is, of course, tropical, the temperature seldom ranging below 85° or above 90°, yet most salubrious and enjoyable. By reason of the rapid movement of the air, evaporation serves to keep the surface of the body cool, unless when engaged in muscular exertion, exposed to the direct action of the sun, or in places shut out from the moving currents of the atmosphere. With the exception of a few weeks in the year, the trade winds are constant, mainly in one direction across the island; the blow is constant, yet the velocity of the wind is very variable, at times forceable, then gentle, exhibiting every degree of pressure from that of a hurricane down to that of the most gentle zephyr. The population is naturally indolent, accustomed to exertion only under temporary compulsion, requiring but the merest show of clothing, and habituated to the simplest diet needing the plainest cookery, and in a domestic sense avoiding the use of all conventional aids to refined ease, comfort, or luxury, the preserving of which would call for care, thought, or labour; the larger number are content with a mere shelter from the sun and rains. As a matter of course, in an industrial sense they are as mere children, wholly ignorant and without experience; the few who have been taught in the simple handicrafts needed in the town, and as labourers or servants of the better families, and those who have been in the service of the company in various capacities evince capabilities and adaptability under instructions, which serve, in connection with their evident willingness to learn, and their docility and self-denying endurance, to insure constantly increasing supplies of native labourers fitted for carrying on any industrial enterprise that may be established upon the island. The Government of the island is in the hands of a lieutenant governor and other officers appointed by the governor of the colonies resident at Curaçoa. The town is garrisoned by a few soldiers, and boasts a fort and some cannons. The cultivatable land is granted on a royalty per acre. There is a colonial tariff and other sources of taxation, the total result of which is insufficient to prevent an annual deficit in the budget.

ARUBA GEOLOGICALLY.—This island, geologically, presents the chief characteristics usual elsewhere throughout the world in localities noted for the production of gold obtained from the soil or from operative vein mining. The soil represents the disintegrated and eroded matter belonging to the "transition rock system," partly belonging to the primitive and in part formed from rocks of the secondary period. The large blocks of stone strewn on the level plains, the rocky bunches and rugged ridges mainly within the basins heretofore described, the huge piles and heterogeneous masses covering the tops and sides of many mountains, are granitic, yet differing from common granite in fineness and compactness of crystallisation, as well as in a nearly entire absence of mica, this being largely substituted by hornblende—the result, a syenite. Accompanying the syenite, and with a near relation thereto, are found trap rocks, greenstone, serpentine, talc, talcose, and clay slates. Porphyry and porphyritic dykes are of frequent occurrence. Magnetic iron ore is found in fine grains distributed in some of the rocks, sometimes largely deposited between the serpentine stones; it is present invariably in the residue obtained by panning down the sand or soil wherever procured, and is always a part of the heavy residues remaining when prospecting pounded rock or mill tailings. As may be expected in such formations, the sulphides of iron are found as an invariable constituent. Soil, sand, fragments of rock, and the silicious matter eroded from veins and bunches of quartz existing almost everywhere over the island, when dug up or gathered from the rools or gulches, the valleys and slopes of the mountains, even that from very high elevations, furnish the data whereby the parent rocks may be designated, and the system to which each or a class belongs, and as elsewhere so here in Aruba, in such material gold is found.

GOLD DISTRICTS, GEOLOGICALLY.—The finding of gold in the alluvium and in vein rock preceded geological classification, but the work of scientific explorers has resulted in a definition of the system and of the general characteristics of the formation in which gold exists, or the conditions given in which it may be looked for with confidence. These conditions may be summarised as follows:—Gold, in the general way, has been found most abundantly in the formation belonging to the "transition system"—in the soil representative of that system, in the quartzose rocks or veins of quartz traversing a country rock, which is interchangably composed of granite, especially the syenitic type, trap, greenstone, or serpentine, talcose, and clay-slates, the existence of hornblende, porphyry, and porphyritic dykes being essential or common. At Cumanje, Mexico, a rich gold mine is found in syenite. The rich gold and silver mines of Guanaxuato lie in slate and porphyry, in immediate association therewith syenite and greenstone. The mines of Zakatica are found in syenite, slate, and greenstone. The gold mines in Hungary are all in syenite, greenstone, porphyry, and trahite. The metalliferous region of the Ural, Russia, producing iron, gold, platinum, and copper, has a like geological formation. The celebrated auriferous deposits at Smartsville, California, lie upon a bed rock consisting of a compact, fine, granular greenstone or trap. At North San Juan the bed rock is granite, interchangable with slate. In Sierro county serpentine and talcose rocks predominate. In San Bernadino county rich gold ledges are found in slates and granite. One of the most extended and richest gold-bearing belts in California is bounded on the east by granite, and the west by metamorphic slate. In the territory of Idaho the bed rock is mostly granite.

GOLD DISCOVERY IN ARUBA.—The discovery of gold on the island was made in the year 1824. During 30 years all labour was directed to the alluvial deposits in the rools or gulches and valleys among the mountains. From remaining piles of debris and evidences of diggings, the gulches of the western system of mountains proved less extensive and remunerative than the eastern. The workable ground is not so great, the gulches short and narrow, and but little appears to have been done on the mountain sides. The presence of many veins of quartz, easily found and traced throughout the district, would, on the contrary, indicate a probable profitable working of very much ground seemingly never disturbed. Throughout the two basins, and among the mountains of the eastern system, there is ample evidence of a prodigious amount of placer mining. Here the extent of workable ground is very considerable, as well in many gulches, their branches up the sides of the mountains, and even on the tops of some of them, as also in the lower levels, the basins, which have been filled in with the debris and erosions of the vein matter, everywhere abounding. Among the gulches called rooi, Fluit has the greatest notoriety for the production of gold. The dug up and disordered state of the ground throughout its tortuous windings and branches testifies amply in favour of the general profit which must have rewarded toil, wholly unaided by mechanical contrivances beyond the digging tools, the club, batea, and the air for winnowing the dirt, so slowly and laboriously obtained. A legend credits the finding of a 40 lb. nugget, which fell into the possession of pirates. The Museum of Natural History at Leyden possesses several nuggets found here, one of which weighs 6 415 Netherland pounds; a nugget of 5 Netherland ounces is to be seen in the museum of Paris. The placer gold is usually coarse, often found in an adhering matrix of quartz, and of unusual fineness, some specimens upon assay showing 892, or 21 carats 4·9 grs., the alloy silver.

CONCESSIONS IN ARUBA FOR WORKING THE GOLD MINES.—About the year 1854 a concession was specially granted to one De Yonge conveying "the exclusive right to work the grounds of Aruba containing minerals." Considerable exploring was done under this concession, many quartz ledges discovered and opened, and some copper veins worked superficially. No machinery was erected, nor regular or systematic development undertaken. Some ores were shipped for treatment, but after some years of struggle there were neither sufficient encouragement nor funds to save the concession from forfeiture. In the year 1867 an Italian, named Francisco Isola, obtained a similar concession for a period which could be extended to 35 years, also granting "the exclusive right to exploit the grounds of Aruba containing minerals." This concession was transferred to the Brothers Ricketts, of New York. Considerable capital was expended in exploiting; some in regular mining and selecting ores for shipment. The selected ores, to the extent of over 9 0 tons, were transported to Greenville, New Jersey, U.S., and treated. The mass of the ore raised at many mines was put in pile for exhibition, or to await the erection of adequate means of reduction. These ores remain pretty much in their original condition and quantity. The expenditures occasioned by these operations, it is said, largely exceeded the proceeds. Accordingly measures were devised for a sale and transfer of the concession to a company in London. Several reports were obtained to aid in this design, among them one from the superintendent or manager under the Brothers Ricketts. All of these documents were published in connection with a special report made by Mr. F. Taylor, of London. The transfer was made in 1872.

OPERATIONS OF THE ARUBA ISLAND GOLD MINING COMPANY.—The share capital of this company was fixed at 50,000 shares, of 10*l.* each, of which 5000 were subscribed as "A" shares, each of which entitled the subscriber to four "B" shares as a bonus, thus absorbing 25,000 shares. The other 25,000 "B" shares were retained by the vendors. In addition to these 25,000 "B" shares 10,000*l.* of the subscribed capital were paid over to the vendors, or absorbed in and about the negociation, examinations, reports, and transfer. About the sum of 40,000*l.* remained for the working fund. Five stone buildings were erected at Bushiribana, and a roadway constructed to the port town. The buildings consist of a smithy, carpenters' shop, office and store house, and two dwelling houses. A mill site was selected and a frame mill erected for the reception of machinery, to consist of engine, boilers, a 20-stamp battery, four grinding-pans, six concentrators, and the necessary moving gear. The unaccountably singular selection of an elevated bunch of syenite rock for the mill seat inflicted a serious delay and extraordinary expenditure. Impressed with the suggestions made in the reports referred to, with relation to the use of the wind as a motive-power, the company, in the absence of proper engineering advice, caused several windmills to be shipped and put up on the ground adjacent to the mill. Instead of seating the engines and boilers these mills, erected at a great cost, were put in connection with one battery of five stamp-heads, one of the windmills being used for supplying water. Disasters followed—a waste of time, money, and endurance. The "constant" irregularity of the motive power brought wreck to the windmills, and belittled the effective working power of a mill which had already cost double the outlay in time and money needed to complete a successful mill of the intended capacity. These windmills are all in ruins. The mines, with two or three exceptions, remain as they were in 1872: much that is depressing, and very much latterly that invites expectations never to be realised, but no judicious information, to be used as a guide hereafter, cumbers the records of the company. In point of fact, that stage of operative mining has been reached when additional capital is required to demonstrate

policy to spend money so long as there is sufficient uncertainty to gild the future with "great expectations."

THE MINES OF ARUBA.—*The West Point Mines:* The slope of the hills and level sweep of land at the west end exhibit the most notable remains of the "gold diggings." Here the surface is found to consist of sand, gravel, and clayey soil, mixed with pieces of syenite, serpentine stone, or greenstone, the binding matter being silicious and ferruginous, and containing gold in coarse grains, often in small nuggets, imbedded in a matrix of quartz. Superficially there seems to have been no indications of veins, no "blossom rock," outcroppings, or ridges of quartz, or other metalliferous rock. The pits and deep cuts expose a loose composite material, without evidence of vein formation other than threads or thin sheets of gold bearing quartz, which are neither persistent nor regular—often a network, in which rich pockets have been found. The character of the work done, as well as the vast piles of displaced material, furnish proof that much gold must have been procured. Some specimen nuggets are still retained on the island as curiosities. These mines have been worked at various times since 1824 wholly without machinery or system. The inflow of water finally prevented work, and nothing has since been done to test the very probable existence of veins at greater depths.

Mines West of Bushiribana.—On the level as well as in the mountains west of Bushiribana many mines have been discovered, upwards of 47 being named upon the map. Upon some of these more or less work has been done in shafts, shallow pits, and cuts, or open drifts. From the Mosquito some selected ore, and also the Calabasa is credited with having yielded well at Greenville. At the latter mine considerable work has been done, and some piles of quartz remain upon the ground. The Yanchi appears as a bunch of white quartz dominating the surrounding level. It can scarcely be termed auriferous, being an exceedingly granular coarse white quartz, and superficially affording no evidence of being a vein. The Casa Blanca, Tankelander, and Paradero are among the mammoth veins of the island. If found rich enough to work their united capacity may be relied upon for hundreds of tons daily, and they are practically inexhaustible. Generally the rock is poor, as usual in ledges of so great magnitude, and you cannot at times get a "colour." I am, however, by no means of the opinion that such ledges cannot be made to pay a fair profit under intelligent management.

Mines at Bushiribana.—In the immediate neighbourhood of the works at Bushiribana a sufficient number of mines have been opened to furnish many hundreds of tons of workable ores daily. Several are within view from the mill, and others less than a mile distant. The Bushiribana appears at a depth of considerably less than 100 ft. to be a lode of more than ordinary promise. The vein matter lies between walls very well defined, averaging 3 ft. or over. The rock is a fine-grained quartz, rusted black and brown, the richer pieces highly sulphuretted, and where fully decomposed showing free gold. The lode may be traced several hundred feet on a level surface, in close proximity to the buildings. The Kubushi lies in sight to the south of the mill. Considerable ore has been raised from this mine by shaft and open-cut. The ore is a white quartz, stained red from iron, and of excellent character. These veins, together with the North Bushiribana, Limpes, Serra Hacha, Mativitiri, and several others also in sight of the works—the last-named one of the very large poor veins—would of themselves constitute a mining property of extraordinary capacity, numbering from 15 to 20 mines.

Mines East of Bushiribana.—Viewing this part of the island from the Arikok Mountains you have the two basins below you, exhibiting a picturesque scene of wild, gigantic disorder, and around you the twisted peaks, tortuous ridges, and the rugged and bleak mountains extending from shore to shore. The existence of gold in these basins, mired in all directions, and in the gulches has already been mentioned. Properly speaking you have in view the true mining district of the island. The mines in this extensive district comprise from 70 to 80 lodes, named and briefly described in Mr. Taylor's report. Many of these mines have little importance other than a location and name, no work sufficient to demonstrate their value having been done, but there are also others sufficiently developed to warrant the supply of an indefinite quantity of good workable ores for generations. Beside these there are several lodes wholly undeveloped and of great magnitude, which, like those heretofore referred to, may be made to pay a fair profit when worked under a properly devised system. Among the developed or partially developed mines those most worthy of mention are the Urataka, Chaboruri, Sombrero and North Sombrero, Picaron, Burro Muerto, Cien Fuegos and South Cien Fuegos, Serro Blanco and West Serro Blanco, Mira La Mar, and Schonberg. The Urataka and Chaboruri veins lie within the westernmost basin, the Sombreros, Cien Fuegos and Burro Muerto in the eastern. The Mira La Mar promises to become a vein of great value. The Picaron and Burro Muerto are also very promising. The Serro Blanco and West Serro Blanco are situated on the top of a mountain and not far apart. The country rock is clay-slate, large areas of which are stripped of soil, compelling you to walk over slate split and stored up on the sides and sag of the mountains as if ready for shipment. The wall rock may be termed talcose slate. In this respect the locality differs from almost every other part of the island. Among the mines of great magnitude undeveloped may be mentioned the Manasa, from 15 to 20 ft. wide, iron-stained quartz of a coarse character; the Fort George, the outcrop of which may be seen afar off, and you may ride along on either side of it several thousand feet—quartz coarse, white and stained red, in width from 15 to 30 ft.; the Ricketts, also a vein of great dimensions, more elevated in situation than the last—quartz a coarse white. Besides the auriferous quartz veins there are also two localities in which copper mines or ores more or less impregnated with the sulphides of copper are found in considerable number. One of these districts—the Daimari—lies on the north, and the Balashi to the south. But little can be asserted of these veins, the cuts or pits are filled in mostly, and there is no testimony with regard to the value of the ores which were shipped.

VEIN CHARACTERISTICS.—The formation in which the veins of Aruba are found fixes their character as true fissures, extending indefinitely downwards. In mines sufficiently developed the features usual to permanent veins are observed with as little irregularity as in such veins elsewhere. Very few shafts have penetrated deep enough to pass the usual disturbances noticed in auriferous vein mining universally, as elsewhere the crevice narrows and widens, pinches out, is lost, and is again found. No mining district anywhere known furnishes in the early stages of development better evidence of the existence of permanent metalliferous rock in quantity than do the larger portion of mines in Aruba so far as judgment can be formed.

ORE CHARACTERISTICS.—The vein matter is predominantly quartzose, largely massive quartz in a number of mines. Generally speaking, this massive quartz rock is sparsely auriferous—poor. It is usually granular in crystallisation, a coarse vulgar rock, stained oftentimes by iron, but frequently an almost unimpeachable white. In such rock visible gold is extremely rare, the redeeming feature being an invariably small quantity of iron sulphide, a small percentage of which is auriferous. Now and then pieces of "honeycomb" cellular quartz are found in such veins; these are free gold-bearing. The wonderful abundance of the ores, the rare accessibility of the ledges, and the resulting low cost of mining, invite the adaptation of machinery for reduction in the large way. The fewer number of really good mines contain ores of a mixed character, more highly sulphuretted, very variable in colour, metalliferous, and gold-bearing, in part free, and in part minera lised. The percentage of sulphides is usually low, the average scarcely beyond 3 per cent, but invariably present, and at times massive. In connection with the iron sulphides none of the other sulphurets, such as silver, lead, copper, arsenic, antimony, seems to be met with. A small quantity of silver is in association with the gold as an alloy, never noticeable in the rock as an independent sulphide. It will be shown hereafter that the gold in the ores is nearly evenly distributed as free gold and gold mineralised. Of these iron sulphides the larger portion is not gold-bearing, or very sparsely so. By carefully panning down a sample the residuum may contain from 200*l.* per ton, while the first thrown off will scarcely show a trace.

EXPERT VALUATION OF THE ORES.—*Sampling Ores and Tailings:* Misadventures in gold mining mainly arise from delusive estimates of the ore intended for treatment. This delusion originates through natural cupidity and design in the outset of the enterprise, and afterwards it is sustained through attempts to cover default in the results falaciously anticipated. Bad outcome from overrated ores must be excused by the showing of rich tailings, the samplings taken from the drop where only the heavy refuse settles, the estimations, however, being made as if the sample represented the whole of the ourgo. Samples of ores or tailings and of sulphurets are commonly sent to the directory unaccompanied with all the facts essential to samplings. The assay represents nothing but the samples themselves. In all of the ways practised by inexperience, as well as by design, the home direction of the Aruba Company has been misled, excepting alone by the work done by Mr. Taylor.

High and Low Grade Ores.—What is termed high grade ores consist of a small percentage of the richest selected out by hand not often exceeding 5 per cent. of the ores raised. Out of all the ores mined from 1870 to 1873 the richest ores amounted to less than 900 tons in 21,139 tons—between 4 and 5 per cent. The few tons reduced under Mr. Neuman's management were of such selected ore. That latterly reduced consisted mainly of the rejected ore, not entirely, since the superintendent endeavoured to restore this, now termed by him "dump ore," to the condition in which it was raised from the mines without mentioning that fact in his correspondence. The high grade ores being the least suitable for pan amalgamation yielded scarcely half of the gold contained, part remaining in the sulphides, part going off with the corrupted and lost mercury, and still a part with the flow in infinitesimally small particles. The great loss of quicksilver adding seriously to the cost of reduction.

The Ores as Raised.—It was my object to ascertain the working value of the ores as raised from the mines as near as could be by the ordinary horning or prospecting. For this purpose I visited all parts of the island and selected samples such as would fairly represent the ore as it came from the mines. Several hundreds of tons of the ore brought from many mines to the mill furnished other samples, care being taken to take samples of the ore placed behind the battery intended to replace the ore selected out and shipped. The results of this investigation have been given. Acting under a rigid purpose, not to self deceive in selecting the samples, a result was reached which may be absolutely relied upon to establish this fact: 67 samples fairly taken from a pile of rock gathered as mined from many mines in various parts of the island show that the average value surely obtainable from the ores, as raised from the mines by amalgamation of the free gold, should be 7 dwts. A considerable experience in treating sulphurets enabled me to fix an average value to those in the ores of Aruba. In my first notes, August, 1875, 3 per cent., or 60 lbs. per ton, and worth 5*d.* per lb., were my estimates. This would give as the average value of gold, not procurable by amalgamation, at 6 dwts.: adding the values 7 dwts. and 6 dwts. = 13 dwts we have the per ton average value of the entire gold contents. Subsequently I was induced to ascertain how nearly this result, 13 dwts. per ton, tallied with the average of the assays made by Mr. Claudet, tabulated on pages 72 and 74 of Mr. Taylor's report. I found a difference of only 2 dwts. between my value by prospecting and Mr. Claudet's value by assay. These several verifications, now and heretofore given, are not accidental, and they are free from assimilation. I anticipated the working results to verify the prospect results, but was surprised when I examined the tables of assays to find the free gold prospects and the estimate of sulphurised gold added together so nearly tallied with the assay in which the whole gold contents of the ore is gained. The working value of the ores thus shown by prospecting, and afterwards verified by the milling of over 500 tons, would convince the judgment of any experienced operator, but when that value is further substantiated by 49 assays of ores gathered for a like purpose from as many mines, the conclusion becomes irresistible that the ores as raised from the mines on the Island of Aruba are worth in gold from 13 to 15 dwts. per ton of 2000 lbs., one-half to two-thirds of which may be obtained by amalgamation.

Value of Gold Ores. The value of gold-bearing ores is generally overrated in the popular mind. It is a fact no less surprising than true, and easily demonstrated, that the bulk of auriferous rock milled in the gold mining districts of the world yields less than 10 dwts. per ton. Phillips tabulates near 500,000 tons of Australian ore, the average yield of which was 9·90 dwts. per ton; also 1,760,651 tons St. John del Rey, Brazil, which yielded 8·20 dwts., the work of some twenty years. Recent reports from the latter mines show an increase in the yield, after a period of most unsatisfactory results. A late report gives 12½ dwts. as the yield [illegible] of several thousand tons. Periodical reports are made of the yield of the [illegible]ip and Colonial ores, a recent one stating a profit of 760*l.* for the month, the ores yielding 6½ dwts. per ton; Western Reef, 6¾ dwts.; and New Eastern Reef, 6 3 5th dwts. per ton. A large number of quartz mines in California furnish ores yielding less than 10 dwts. per ton. The same may be averred of every other mining state or territory, especially so of the European continent. Richer mines are exceptional. The bulk of bullion from veins is the product of low grade ores.

GENERAL REMARKS.—Aside from efforts to collect reliable data for the purpose of estimating the free gold working value of the Aruba ores, I also caused the erection of a small furnace, by which I was enabled to experiment on about 1000 lbs. of sulphides and rich sulphide rock. The result was entirely satisfactory to myself, and fully established the fact that when such ores are selected, or the sulphurets concentrated out of the mass by a sytem of machinery adapted for that purpose, they can be treated on the Island most successfully, and at a cost no greater than would have to be paid in freight alone if shipped for sale or for a foreign treatment. During the two periods of management on the island there was little or no attention directed to an investigation of the ores, the cost of mining and of reduction, the loss of mercury and matters of the kind; consequently the voluminous correspondence is, in fact, barren of that information most essential to an intelligent home direction. Make-shifts in gold mining never pay anyone but the superintendent and the employees. It is idle to expect any other result. Working largely, systematically, and with properly adapted machinery, will ensure success. Any temporising expedients will end in disaster, profitless to all that are not salaried.—10, *York street, St. James's, Sept.* 12. G. W. BAKER.

CALIFORNIAN CAPITAL IN CHILI.

SIR,—Besides the Condes Company, taken up by English capital, in Chili, I have now to advise the arrival of the Californian agents of the Catapilco Hydraulic Gold Company at this port of Valparaiso. The International Exhibition at Santiago induced a number of Americans and Californians to visit this country, and amongst others Mr. Quinby, who represented the largest number of firms, and who also has a knowledge of hydraulic washing. He was induced to visit the Catapilco property, 36 miles north of Valparaiso, and seeing the great value and extent of the washings, he agreed to propose it in San Francisco. The result has been the formation of a company with $1,000 000 for the Catapilco gully, which forms one-fifth of the entire washings, and the arrival here of Dr. Burns, of Baltimore, and staff. The history of the conquest of Chili by Almagro and Valdivia proves that the greed of the Spaniards was simply gold, gold, gold, and that they found it extended in the veins and washings from the most northern town of Copiapo to the very south—in fact, gold washings are now being worked at Sandy Point, in the Magellan Straits. At Copiapo, Almagro first received $300,000, and then $200,000 in gold from the cacique and Indians. Valdivia, immediately after the foundation of the capital at Santiago, employed Indians in gold washings at Marga-Marga. Subsequently he pushed his conquests into the Araucanian territory, and founded the towns of Villa Rica and La Imperial, and three forts at Arauco, Tucapel, and Puren to protect the Spaniards. He employed from 15,000 to 20,000 Indians in the gold washings at the above-named points, and they extracted as much as 200 lbs. of gold on some days (*vide* "Historiadores de Chile:" Pedro Merino de Lovera. Cap. xiii. and xl., page 144). These data are confirmed by the different historians, and to prove it I have made numerous journeys, which prove to me that the Chilian gold fields will soon be known all over the world. Amongst others I visited the Catapilco washings. The process employed is the same as that of the time of the conquest; a pit or hole is sunk through the auriferous gravel 20, 50, or 100 ft. till the bedrock is reached, at an angle of 35° or 40°, so that the miner may bring up the gravel in a hide bag on his back, which he then carries to the nearest stream, and washes in a wooden bowl or basin in such a rough manner that all the fine gold is lost, and the quantity of gravel which he works is very limited, and only in the rainy season in the North of Chili. This explains why gold washing has not been successful hitherto. With the hydraulic system and capital we shall soon change the face of the country, which is known as the largest producer of copper, of a fair amount of silver, and, in the future, of gold. I may add that I have secured a celebrated old gold vein or quartz reef 20 ft. wide, called the Amazonas, close by the Catapilco washings, and in sight of the sea, with a canal within 1000 yards of the mine; nearly all the samples from the old desmontes show gold by the poruna, or native assay.

I may also state that I cabled Mr. George Batters on April 20 an offer of the Catapilco washings, before Mr. Quinby had arrived at San Francisco, at 200,000*l.*, including working capital, and that the Californians have formed a company for the fifth part of the property at the same figure—$1,000,000—if we do not go into the question of exchange, now 33d. My brother—Henry Sewell, author of the pamphlet on the Emma Mine—also offered Mr. George Batters the Flagstaff Mine for a tenth of what it was afterwards brought out at. Verily, the British public do not like to pay cheap, and when too late they will find the Californians have come down in a rush to Chili, and seized all the good properties, for which they will pay then the prices asked for. Having opened an office in Valparaiso for transacting mining business, I enclose our card.

Valparaiso, Aug. 2. —— JOHN P. SEWELL.

RICHMOND CONSOLIDATED MINING COMPANY.

SIR,—Having incidentally heard a few days ago that a pamphlet was in preparation by a Mr. Lythgoe on the subject of the Richmond Consolidated Mining Company, I, as a large shareholder, naturally felt considerable interest in its appearance and in the information it was to be presumed it would furnish. I have since been favoured with a copy of this precious pamphlet, and, after carefully perusing its contents, I was led to exclaim—verily, "the mountain in labour hath brought forth a mouse."

With regard to the authors of this wonderful pamphlet, we are informed by Mr. Postlethwaite, in the Journal of last week, that at the address given he was told that "nothing had there been heard of the parties for four months;" and he wisely suggests that enquiries should be made into the antecedents of the two gentlemen who have put their names to the precious production. The directors in their circular to the shareholders have, to some extent, enlightened us on this point, and, besides confirming Mr. Postlethwaite's statement, also tells that their official was informed that "every hour an execution for rent was expected to be levied." A pamphlet emanating from such a source will, doubtless, have received all the consideration to which it is entitled.

We are officially informed than neither of the concoctors of the pamphlet has ever been a shareholder in the company, and I must, therefore, give the person signing himself "G. McHenry" credit for philanthropic motives in recording his "deliberate opinion of the Richmond Consolidated Mine," and in submitting "all the papers relating to the company to Mr. J. P. Lythgoe to grapple with." The latter gentleman acting "as instructed," and, as a matter of course, for money consideration, I cannot accord to him similar credit in the matter.

The unscrupulous misstatements and misrepresentations of the authors of the pamphlet are so palpable, and their object so transparent, as to render any notice of them almost a waste of time, and they may, therefore, be taken for what they are worth, which is really less than nothing. It is a pity, however, in the interests of justice that such mischievous and unprincipled meddlers should by their mythical existence, or probably assumed *alias*, be permitted to put in circulation their vile and scandalous misrepresentations without being visited by the retribution they deserve.

It is the "deliberately recorded opinion of Mr. G. McHenry that the Richmond Consolidated Mine never was worth more than 50,000*l.* or 60,000*l.*," and that "its 550,000 shares, therefore, were never intrinsically worth more than 1*l.* each." In refutation of so palpably absurd and dishonest an "opinion," I need merely refer to the fact that more than 160,000*l.* has already been returned to the shareholders in dividends honestly earned out of the products of the mine—a sum equal to 61½ per cent. of the entire share capital. Besides this, we are informed by the circular of the directors, dated the 9th instant, that "the output for the month of August just ended is 54,000*l.* sterling;" that "the very last information they have received justifies them in stating that the profit for that month is very little short of 20,000*l.*;" and that "there is at least three years' ore in sight, mostly of good quality." So much for the official statements of the past and prospective value of the mine, on the one hand, and the "deliberately recorded opinion" of its detractors on the other. *Ex uno disce omnes.*

With regard to the so-called "report" by J. P. Lythgoe of "the result of his investigation," I would ask—what does it amount to? Simply nothing. So long as the mine has been proved to be a valuable property, which is an indisputable fact and which by its working and development has in reality proved to be a much more valuable property than the original vendors ever contemplated or anticipated, why need the present shareholders now trouble themselves as to the circumstances or terms upon which it was purchased? The present directors are not responsible for anything which took place between the vendors and the original promoters of the company; and it appears to me to be a gross libel to impute to them anything which can possibly bring them within the category of "market manipulators," or promoters of a "bubble" company, and to charge them with the payment of "unearned dividends for market considerations." The dividends which have been paid have been shown by the certified published accounts to have been honestly and legitimately earned; and had it been otherwise, and for the purpose of "rigging the market," as is basely insinuated, it is inexplicable why the directors and their friends should not have taken the opportunity of realising at a high premium at the expense of innocent and unsuspecting investors. Their conduct of the affairs of the company, and the fact that they are amongst the largest of its shareholders, is a sufficient proof of their confidence in the *bona fides* and intrinsic value of the mine, and completely negatives the vile insinuations and misrepresentations of the pamphlet-ere, one of whom appears, on enquiry at his advertised address, to be non est, and the other described by one of your correspondents "as a shady accountant hired to concoct specious falsifications of honest accounts."

As to the figures of J. P. Lythgoe, it will be apparent to anyone at all conversant with accounts that he has, for the purpose of framing his report "as instructed," manipulated them in a specious and delusive form, and drawn from them illogical and uninferential conclusions in order to alarm timid shareholders, and to serve the purposes of those by whom he is employed. If I am not misinformed the present is not the first attempt of this gentleman to depreciate the value of the property of the Richmond Mining Company; and I would add my word of warning to that of the directors, whose assurance as to the condition and prospects of the mine ought to be accepted in full confidence, and I would ask my co-shareholders to reflect for a moment before needlessly sacrificing their property for the benefit of unprincipled detractors such as the concoctors of the pamphlet just issued have been show to be. I would urge them to consider well who are the true and faithful protectors and guardians of their interests; whether, on the one hand, the directors, who are recognised as men of character and position, and who themselves are amongst the largest shareholders, or, on the other hand, unscrupulous speculators of questionable reputation, who are not, nor ever have been, shareholders in the company. JUSTITIA.

Sept. 11.

CHONTALES MINING COMPANY.

SIR,—The last call has been made of 5*s.* on the unpaid shares, and our financial position in May last was standing thus—2000*l.* in hand, no debts, and well provided with stores. The object of what was then done was to attain the ends to be accomplished, and in consequence of the continual deficiency on the monthly operations of the mines. This notice is issued after the manager has had the whole of the dry season for repairs, and by accounts received on the 12th inst. he (the manager) appears to be as far off as when he arrived in December last, working 14 days, and crushing 630 tons instead of 3200 tons, which we have a right to expect, the capital of the company having been invested in supplying machinery equivalent. With the call circulars is a statement from Mr. Danby, that with the Wheeler pans after their erection he estimates the yield will be increased 400*l.* per month; he does not say when they are likely to be completed. The circular goes on to state, "The practical effect of this will be to remove the present inequality of the shares, and place them all on an equal footing as fully paid up; the time chosen is when the shares on which 35*s.* have been paid are advertised for sale at 5*s.* per share, the object for so doing doubtless the shareholders vary in opinion. I refer the shareholders to a precedent whereby the call might have been avoided. At the annual meeting Nov., 1873, our noble Chairman said, "At the last half-yearly meeting the directors stated that they need not make the last call; they had not done so, but since then they had been disappointed in the returns through circumstances which he had explained, and he had borrowed 2000*l.* to save them from making this last call"—*vide Mining Journal*—it becomes a question of some anxiety for explanation, Do our directors consider our financial position worse now than then? At the present time we have, or ought to have, an equivalent of stamping power for crushing 3200 tons per month, whereas in 1873 we had only sufficient for 2000 tons per month; also looming in the distance 400*l.* a month profit, to be derived from the Wheeler pans, which is intended to compensate for the 75 per cent. of gold that has been hitherto lost in the treatment of the ore.

There was a balance in favour of the company on June 30, 1876, of 1923*l.*, which amount being gradually reduced causes anxiety as to what will become of the amount of the last call that it shall not be frittered away through mismanagement. In the marine timekeeper, on which depends the lives of the crew and the property of the merchants, varied skill is brought to bear, escapement maker, finisher, &c., as to its fitness for the purpose for which it is intended. The crucial test is with the examiner. Without his having tested and passed the different portions of the mechanism, the instrument would be valueless; so with large undertakings, mining or otherwise. In the former there may be any quantity of payable ore, plenty of money, and machinery to work the mines, but without the discriminating eyes of the directors, however good the prospects of the concern may be, the chances are that it will come to grief.

I think, before making the last call, it would have been an act of courtesy on the part of the directors to the shareholders to have convened the annual meeting earlier, thereby giving the shareholders an opportunity of expressing their sentiments as to the desirability of the call. The June account having arrived, there would have been no difficulty in making up the financial statement for the year. As shareholders we are aware that we are powerless in the hands of the directors. If the operations of the mine were satisfactory the concession would not be expected; such not being the case some shareholders would deem it desirable before either directors, managers, or calls were made to have a voice in the matter. W. B. P.

Bristol, Sept. 14.

FOREIGN LOANS, ENGLISH RAILWAYS, AND BRITISH MINES.

SIR,—Pray what is the cause of the present stagnation in business?—*i.e.*, commerce, trade, manufacture, constructive and prospective enterprise, shipping, engineering, railway, telegraph, mining, miscellaneous, with social and political advancement. Why, the answer is universal and deep-rooted distrust in the *bona fides* and integrity of all public investments and undertakings. If England is to maintain its position acquired through honesty, integrity, perseverance, and healthy, earnest, creation and supply of her natural products of iron, coal, metals, manufacture, and invention, this distrust must be dissolved; her resources and energies must again become unfettered, and her products and manufactures find vent in foreign and colonial markets. There can be no doubt but the mineral and metallic wealth of the county constitute the backbone of her strength; but how do we find these resources crippled and foiled? Why, in respect to iron alone Denmark imposes a duty of 2*l.* 8*s.* a ton; France, 1*l.* 16*s.*; Germany, 1*l.*; Italy, 1*l.* 17*s.*; Russia, 5*l.* 4*s.* to 24*l.* 10*s.*; Spain, 7*l.* 15*s.*; Switzerland, 6*l.* 10*s.*; and the United States, 30 per cent.—while Great Britain is open to the whole world duty free. Again, iron bars, iron wire, steel wire, iron rails, steel rails, iron axles, iron tyres, and steel tyres, with every other description of iron and steel manufactures are equally and cruelly saddled with enormous duties—protective to their own productions, and ruinous to our export growth. No wonder, therefore, that America and Russia show a decided diminution in their imports from this country. In South Staffordshire 93 furnaces out of 148 are out of blast, and in West Cumberland 30 out of 52, while the Frodingham district has 9 out of 19 idle. Other districts are suffering equally with those referred to, and hence the sad mishaps and collapses among ironmasters. Bankers and finance companies are doing next to nothing, money in a plethora, and of no value to the capitalist, and this state of stagnation is likely to exist over the remaining three months of the

...Strikes have paralysed capital, and the stubborn, obstinate ...rance of the miners and workmen place them absolutely under ...direction and control of pedagogues, and until the Legislature ...t laws abrogating the powers of the latter so long will the dis...tude and distrust exist, and exercise a baneful effect on the ...stry and progress of the mineral products of the nation. The ...e of labour must necessarily decline as the volume of products ...off, and the rapid introduction of machinery tends to render ...master independent of workpeople.

...mmercial distrust will not subside until the Eastern Question ...mes settled, and this year will see that issue defined. Allied ...this settlement are associated the existence and prosperity of ...rade with the Levant. Should the strings be pulled too strin...ly on Turkey we may find the Bank is only too fully justified ...sening the volume of trade, for what will be the results fol...ng the fall of Turkey, or in case of a continental war, no one ...moment can foresee; but we may take it for granted that in ...r alternative Turkish, Egyptian, German, and Russian firms ...resent supported through English finance would collapse with ...ble rapidity, while all our foreign trade and commerce would ...sarily pass through an ordeal that would probe our merchants ...manufacturers to their very vitals. One thing, however, is certain, ...that is that the present year will realise the question. Building, ...whole, does not pay; the trade flourishes, for the growing masses ...have houses to live in—the property, for what it worth, exists, ...adds to the wealth and revenue of the country, while the money ...loyed becomes circulated, and never leaves home.

...e same may be said of mining pursuits as a whole, including ...mes and ephemeral concoctions, premiums, douceurs to to law...and landlords' agents, promoters, and brokers. The entirety ...losing game, yet the industry adds forty millions sterling to the ...th of the Mother Country, besides supporting railways, manu...re, shipping, building, and constructive enterprise, all of which ...b coal, iron, and metals. The community in every respect is ...ntaged; the loss is spread over the multitude, yet the principal ...ned at home; hence no depression can extinguish the vital ...gth, fire, and life of mining, for it is intertwined with every ...of our commerce and industry, and must be sustained under ...and every change, no matter at what cost.

...ain, it is not necessary that every mine must prove remunera...to render the pursuit attractive, and were no hazards incurred ...parkling prizes could be realised. Risks must be encountered ...very industry to achieve successes. Lloyd's would succumb ...ships always safe from disasters, insurance would be need...were houses secure from fire and destruction, railways would be ...afest of investments did accidents never occur and the locomo...forever secured to steam and the consumption of coals, but ...dare to say that the present century will terminate ere another ...r of motion succeed that now in use. The discovery of a Van ...s up for fifty losses in mines. Great Laxey is the spring of ...Isle of Man. Minera has enriched hundreds and given employ...t to thousands. Roman Gravels, Tankerville, and Snailbeach ...the roseate hues of life in Salop. Yorkshire, Durham, Derby, ...h and South Wales, the Midlands, North of England, and Scot...flourish through their mines, and, as much as the manufactures ...constructive undertakings, add to the wealth and prosperity of ...several districts, while, in conclusion, there was never a better ...ortunity offered to profitably invest capital in sound progressive ...atures.—79, *Cornhill.*

R. TREDINNICK,
Consulting Mining Engineer.

THE THUNDERER.

...Sir,—Even supposing that the safety-valve did not work, and ...the stop-valve was closed, no accident could have happened had ...pressure-gauge been properly attended to. I would suggest ...every boiler should have a whistle set a few pounds below the ...ty-valve to give timely warning that something was wrong.

B. L. S.

THE ST. GOTHARD TUNNEL, AND ROCK-DRILLS.

...Sir,—I have observed in your highly-esteemed Journal a state...of the progress made during the months of January and Fe...ary by the aid of rock-drills, and knowing the deep interest you ...ays take in such matters, and thinking it may interest some of ...numerous readers, both as regards railway tunnels as well as ...ing generally, and, perhaps, the more particularly all those who ...be desirous of or are seeking information on the subject, with a ...w of employing machinery for such operations, I propose, with ...permission, to compare notes between the reported progress ...the St. Gothard Tunnel and the progress made in that portion of ...Rio Tinto Tunnel by the same means. The dimensions of the ...ding are not given, nor is the nature of the ground stated.

...the Rio Tinto Tunnel we at first tried the machines mounted ...the column or pillar, and subsequently the McKean carriage. ...carriage is constructed to mount nine machines, but although ...had this number of machines we seldom or ever could muster ...four at a time; indeed, I may say that the average number ...did not exceed three machines at once, as the repairs were so ...that the other six machines were constantly in the shop. But ...my intention is to give the simple facts of the progress made, and ...means by which it was done, I will abstain from any further re...ks than a comparison of the work done by the machinery and ...work done by hand in the old-fashioned way in the same tunnel ...the same ground, and under the same circumstances, as near ...possibly could occur in such work.

...The heading in the Rio Tinto Tunnel was driven by McKean's ...s and moved by compressed air. The ground through which ...tunnel is constructed is known as the clay-slate, which vari s ...much in hardness and compactness, and which will account in ...great measure for the difference of work shown to be done in the ...erent months. The dimensions of the heading done by the rock ...ls were about 2·50 metres by 2·50 metres, or a sectional area of ...metres.

...The following tables taken from the daily returns entered in my ...can be relied on as being as exact as possible in such matters. ...tables will show the number of days worked in each month (days ...hours, divided into three shifts of 8 hours, and worked by ...gangs of men). They will also show the aggregate length of ...bored each month, and the monthly advance of heading. The ...table will show the work done by the two machines worked ...columns or pillars, and the second table by machines mounted ...McKean's carriage.

TWO MACHINES ON COLUMNS.

Date.	No. of days.	Length of holes—Metres.	Advance of heading—Metres.
1874—September	2	28·71	2·00
October	26	315·20	26·50
Total	28	343·91	28·50

THREE MACHINES ON CARRIAGE.

Date.	No. of days.	Length of holes—Metres.	Advance of heading—Metres.
1874—November	28	759·35	31·05
December	28	925·65	27·77
1875—January	30	1043·21	37·90
February	28	1294·45	38·40
March	31	1505·79	43·00
April	30	1482·99	42·70
May	30	1404·50	42·00
June	23	1053·81	30·50
July	31	1415·72	48·50
August	28	1172·22	43·20
September	2	58·45	3·50
Total	289	12,116·14	388·52

...portion of the heading performed by hand was done by con...tract, and the price was 70 reals, or 14s. 7d., per cube metre; the con...tractor provided all labour, powder, fuse, and lights—he made an ...advance of about 22 metres a month, and made a very decent living ...of it. With the machinery we made an average of about 39 metres, ...and the cost was about 289 reals, or 2l. 18s. 4d., per cube metre, or ...about 400 per cent. more than the hand labour, taking into account ...labour, powder, fuse, lights, and coals for the engine; but not taking into account the first cost of the machinery, not a small item on such a small piece of work.

It will appear by this that, if the accounts given by the St. Gothard people are not in any way exaggerated, our progress falls very much short of what they are doing.

THOS. ROBERTS, Managing Engineer.

Westminster Chambers, Sept. 13.

THE "SUBSIDISED" ROCK BORER.

SIR,—As one of the public I have been invited by circular to subscribe money for the purpose of introducing the Beaumont Rock Borer into the Carn Brea Mine, managed by Capt. Teague. The circular itself sets out—1. That a provisional contract has been made between Capt. Teague, on the one part, acting for the Carn Brea Company, and Major Beaumont, on the other, representing the Diamond Rock Boring Company, for driving with a percussion drill the 226 fm. level in Carn Brea Mine, for a period of six months, on the following scale:—

For a speed of 3 yards a month	... ...	£18	per fathom.
" 4½ "	... ...	23	"
" 6 "	... ...	27	"
" 8 yards and over a month..		30	"

2.—That a committee is formed, the members of which have guaranteed to pay to the Diamond Rock Boring Company speed money to the extent of 15 fms., or 30 yards, monthly; in other words, a sum of 1080*l.* on the six months working, and an additional sum of 200*l.* for the cost of transit and erection of machinery—together 1280*l.*

3.—The names of the parties in the circular who have promised subscriptions are there set out, and under their authority it is asserted that the object of the expenditure is to "sustain the drooping mines of Cornwall, by lessening the cost of production, and to serve as a competitive trial with other boring machines in Cornwall and elsewhere." Finally, the circular concludes with a request for pecuniary assistance to the fund.

To the circular itself, if it merely recited the general conditions of a contract between one set of private individuals and another, I could not object; any body of men in a private capacity may be permitted to do very foolish things, make vague and meaningless assertions, or throw away their money; but, as one of the public, it is in my opinion decidedly an act of presumption on the part of individuals who, ignorant of the technicalities of a subject, ask me to give the concurrence of my name, and the assistance of my purse, to retard rather than to advance the rock boring question, to perpetrate an injury to mining, and an irreparable wrong to many well-deserving inventors of rock boring machines.

As, however, the public are requested to subscribe to the object in view, and the Beaumont tackle is intended by the Cornish committee to effect that object, it may be well to notice the character of Major Beaumont's borer, the tackle employed, the method adopted by the Diamond Rock Boring Company in driving headings, the progress made at the Maesteg Tunnel, to give some particulars of the Portskewet Works, near Chepstow, and to show that Major Beaumont has no better method or means of doing the work than many others.

THE BEAUMONT BORER.—This borer is described in a circular headed "The Beaumont Percussion Rock Drill and Air Compressing Machinery" as giving a "dead blow;" that is, there is a valve to actuate the piston, but *no maintained connection* between the valve and piston; in fact, the movement of one is independent of the other. This arrangement, it is alleged, "gains both power and speed in cutting the rock," a result no doubt attainable, if it were practicable, by a simple arrangement of mechanical parts to *gain* power. That this feature of the drill is not new it is only necessary to state that the Mont Cenis borers were constructed in a similar manner, and that Ferroux's drill, *long* at work in the Airolo end of the St. Gothard Tunnel, gives a dead blow. The turning and mounting of the Beaumont borer is also not new. In 1867 a patent was taken for turning the drill by means of ratchet wheels fixed in front of the cylinder, whilst the method of mounting the drill is evidently copied from that carrying the McKean borer. The compressors employed by the Diamond Rock Boring Company at Maesteg, and which is presumably the type of that intended to be introduced at Carn Brea, are almost exact copies of those used at the Musconetcong Tunnel in America; that is, they are vertical, single acting, with valves in the piston and in a diaphragm set between the piston and outlet box. In the air pipes, rails, &c., there is but little scope for the inventive genius of the director of the Diamond Rock Boring Company. The pipes are generally of large diameter, serving the double purpose of conveying the air readily and of a receiver, whilst the gauge and dimensions of the rails must be sufficient to take the boring carriage and its attendant weight.

The method adopted by the Diamond Rock Boring Company in running their headings is to have ample power to drive the borers, to employ, as at St. Gothard, Musconetcong, Portskewet, and elsewhere, powerful boring machines, to mount the borers on a carriage so as not to lose time in angling, or setting the machines, and to have a sufficient number of men in connection with the work to complete it in the shortest time possible. In addition, in order to induce the men to exercise their skill, and to give their labour without stint, a premium or "speed money" is offered per yard of ground for any quantity driven beyond a given number. At the Maesteg Tunnel, near Bridgend, South Wales, the scene of the lamentable loss of life which recently occurred from the explosion of dynamite, the Diamond rock boring people are driving a heading in the Pennant rocks, very easily disintegrated by means of a blow, and removed in considerable quantity by the explosion of dynamite in a few well directed holes.

The compressor is vertical, single acting, double cylinders, each 30 in. diameter and 24 in. stroke, driven by means of a pair of steam cylinders 12 in. diameter, with wheel gearing running the compressor one stroke to five of the engine. The air pipes are 4 in. in diameter, and 600 yards in length. Two boring machines are employed, the cylinders of which are 4 in. diameter, and long enough to give 6 in. stroke to the piston. The weight of each borer is 430 lbs. These borers are mounted on a carriage, and are angled and shifted so as to run down the holes quickly. The holes in the face of the heading are from 16 to 20 in number, each 4 ft. deep on the average; the time required to run down these holes is about 4½ hours. The boring carriage is then withdrawn, four or six holes are first charged, tamped, and blasted, and subsequently the other holes are disposed of in one or two volleys.

About one advance is made in 12 hours, or two steps or advances forward in 24 hours.

The weekly result is a drivage of 12 or 13 yards. The quantity of dynamite used is about 15 lbs. to 16 holes. The number of men employed is 15—5 per shift. These men are alleged to receive from 5s. 6d. to 6s. 6d. per shift, and for 7 yards weekly a premium of 3d. per yard; 8 yards, 6d. per yard; 9 yards, 9d. per yard.

On a drivage of 13 yards weekly each man would, therefore earn 10s. 6d. extra—if his wages were 6s. 6d. per shift he would net for six days' work about 50s. per man, equal to 10*l.* per man monthly, a rate of wages much in excess of the salary given to the miserably underpaid Cornish captain, and which goes far to account for the success of this, as it would of any other boring machine. At Portskewet there happens to be a tunnel under the Severn, in the Pennant rock, driven nearly 1000 yards. Here a modified McKean borer is employed. In the end two of these are mounted on a carriage; the cylinders are of the same diameter as the Beaumont borer. The end is perforated with 14 or 16 holes, charged with dynamite cartridges fitted with Brain's fuses, then electrically fired. Five men are employed in each shift. The system of working is almost identically the same as that practised at Maesteg, whilst the wages and premium together are supposed to be sufficient to enable each man to earn 8s. per shift, or 48s. per man weekly. Here, instead of the advance being 12 or 13 yards weekly, it is from 14 to 19 *yards weekly.* Other examples might be cited where equal results are achieved. The Portskewet example, in almost the same locality and in similar rock, is sufficient to show that a high driving speed is not the monopoly of Major Beaumont, and that the Diamond Borer Company has no special tackle for accomplishing special results, or for "sustaining the drooping mines of Cornwall," more than many others. In fact, I am satisfied, from numerous works in progress in Europe and America, that 30 yards per month can be driven in the 226 fm. level at Carn Brea, and that if the committee should enter into the contract with the Diamond Rock Boring Company the latter will demand the sum of 1080*l.* speed money, *equal to a gift* of 12*l.* per fathom.

To show that this view is not exaggerated let it be tested by an approximate estimate cost of the work at the Maesteg rate of wages—two 4-in. borers being employed at 60 lbs. pressure of air per square inch, fifteen men in the end, in relays of five men per shift; 40 lbs. of dynamite to the fathom of ground, 1 yard advance per 24 hours, the stuff trammed and drawn by the adventurers:—

15 men at 6s.	£	4	10 0
20 lbs. of dynamite per yard		2	0 0
Fusee and detonators		0	4 0
Candles, and smiths' work		0	6 0
Wear and tear of borers...		0	10 0
Fitter to repair borers		0	6 0
Coal and sundries		1	4 0
Cost per yard	£	9	0 0
or 18*l.* per fathom.			
1 yard per day, at 30*l.*	£	15	0 0
Cost as above		9	0 0
Profit per yard	£	6	0 0
or 12*l.* per fathom.			

Now let us put a few questions as to how the introduction of the Beaumont borer is likely "to lessen the cost of production," and to effect the partial supercession of manual labour. Will an increase of 12*l.* per fathom of ground "lessen the cost of production?" Will the Diamond Rock Boring Company subsequently take any number of contracts for driving levels or sinking shafts at hand price, and will it forego any profit? Will the Beaumont borer be sold for 40*l.* a-piece, instead of 90*l.* and 75*l.* each? Will intelligent and skilled hands necessary for running boring machines, earning frequently 8s. per shift, content themselves with the miserable pittance doled out to Cornish miners getting 5s. per week? Will the Diamond Boring Company disclose the actual cost of driving 30 yards monthly, or give data which may be useful to the mining interests generally? In short, will the company do more than introduce their borers, show the method of working the ground (which they cannot avoid), by putting 15 men into an end instead of six, and pocketing the subsidy?

The answer to each question is rendered self-evident, and surely each answer is unfavourable to the intent or language of the circular.

It now only remains for me to notice the statement to the effect that the introduction of the Beaumont borer is "intended as a competitive trial with the Barrow drill and other boring machines."

What a pitiable inconsistency and blindness characterises this language. Is the Barrow borer "subsidised?" Is it a 4-in. borer? Are the borers running together? Are 15 men working in the level in relays of five men per shift? Is Capt. Josiah Thomas giving a premium equal to about 70 per cent. of the hand price? Has the Wheal Agar borer ever had a chance of a fair and persistent trial with men and means to effect it? Is the Wheal Agar borer as powerful even as the Barrow, which in turn is of much less power than the Beaumont drill? Then, where are the elements of a fair and satisfactory "competitive trial with the Barrow and other borers," and if these are wanting, is not this language wrong—nay, a cruel wrong—to inventors who are not to be subsidised and placed upon an equal footing with the inventor of the Beaumont borer? Surely, Mr. Editor, the circular ought to be withdrawn, the provisional contract with Major Beaumont rescinded, the Beaumont borer relegated to its true position, and regarded no more than the McKean, the Darlington, or the Ingersoll, each of which, *with a proper organisation of men can effect as much work and at as little cost as the Beaumont borer.*

In short, if the members of the committee were practical and wise they would decide to erect a compressor, select a few levels in some important mine, get a good set of fellows to run the borers, a competent man to organise the work, two or three different kinds of borers for trial, and proceed to obtain results which would, doubtless, benefit themselves as well as the mining population of Cornwall. In this way they would not seek foreign and selfish aid, they would have the merit and satisfaction of working out their own salvation, and of extending the art and practice of mining in a county at one time famous for its engineers and its mechanical appliances.

X.

WITHDRAWAL OF THE CORNISH ROCK DRILL PREMIUM.

SIR,—I read with much regret in your report of the meeting of the Royal Cornwall Polytechnic Society, published in the Supplement to last week's Journal, that the premium of 500*l.* proposed by Mr. Basset for the boring machine most capable of expediting and economising in an appreciable degree the sinking and driving of Cornish mines has been withdrawn. The withdrawal is regretable, because the mere working of the competing machine in the county would have done so much to familiarise the Cornishmen with mechanical boring that the chances of one or more of the machines in Cornwall would have been largely increased, but it is infinitely more regretable that the original liberal proposal has been replaced by one in every sense objectionable, because in will positively delay the adoption of boring machinery by shaking whatever little confidence may up to this time have been created. The experiment is to be made with a new and untried machine of questionable merit, yet the guarantee fund is being raised under the auspices of the Cornwall Polytechnic Society for the direct advantage, if any advantage be derived, of the Tincroft Mine, whilst if there be no advantage it will unjustly be said that the Royal Cornwall Polytechnic Society has given machine boring a fair trial, and cannot recommend it. Another objection to the arrangement is that both Capt. Teague and Major Beaumont have failed as user and inventor respectively of percussion rock drills, Capt. Teague having made, I think, more than one unsuccessful attempt to use them, and Major Beaumont being even himself so dissatisfied with his own efforts that he has found it necessery to patent several distinct arrangements in the hope of getting something that will work well.

As the names of Major Beaumont and the Diamond Rock Boring Company will be connected with the proposed test, it should be distinctly understood that I am referring only to percussion drills—the diamond drill in which the Diamond Rock Boring Company are chiefly interested being an exceptionally good machine for the purposes to which it is applicable, and capable of doing work which no other drill can touch—but with regard to these I contend that the machines of Dubois, François, Warrington, Ullathorne, Darlington, McKean, Dunn, the Burleigh, the Power Jumper, and others, having all been successfully and thoroughly tested in practical work, one or other of these should have been selected to represent machine boring rather than a machine which has scarcely been tried, but which has been invented by a gentleman of almost unlimited pecuniary means and with powerful and aristocratic influence.

I know that many of the less fortunate inventors of machine drills have been looking forward with the greatest hope to the proposed competition, and more than one of them have offered to supply mine captains or adventurers with machines at cost price in order to get the opportunity of showing their inventions in practical use in Cornwall, each feeling confident that whether successful or otherwise in gaining the premium, he would at least have succeeded in demonstrating that his invention had sufficient recommendations to justify its adoption. Mr. Basset's withdrawal has dissipated all these hopes, and with them the hopes of many miners that machine boring would be generally adopted in Cornwall. Had only the half-dozen inventions mentioned above been put into practical operation in Cornwall through Mr. Basset's premium the benefit that would have been conferred upon the county would have been inestimable, whilst the trial of any single machine can do good to no one beyond those immediately concerned in the

invention. The 1000*l.* is really being raised for doing no more than Messrs. John Taylor and Sons have done thrice over out of their own resources, so that it is most unjust that such a project should be saddled upon the Polytechnic Society. Surely some of the inventors of rock-drills will raise their voice in the matter.

Illogan, Sept. 14. MINE CAPTAIN.

BORING MACHINES.

SIR,—My brother Cornishmen are undoubtedly clever fellows, yet "a good bal makes a good Capen," and "Jan, you scratch me, and I'll scratch you." Major Beaumont, M.P., director of the Diamond Boring Company, associated with sundry M.P.'s, comes into Cornwall, offers a borer and boring-tackle to our "big wigs," but as a "'cute" man of business demands payment for the use of the perfect boring machine to do the boring trick. "Big wigs" flattered into profound—nay, worshipful—veneration for the munificent offer consult with their satellites, "litt'e wigs" and bal capens, scratch each other, pull out their purses, heavily and lightly laden, and put down sums varying from 300*l.* to 21s. to command a "practical" exhibition of the *hiego presto!* boring machine.

Bah! Let us not be deceived. What are the facts now at this time to be garnered up in South Wales—a place only some 10 hours distant from our "Gotham" Cornwall, or from the Polytechnic, the arcadium of the quintessence of mining wisdom for the long period of 12 hours in the year?

Why (1), at Maesteg, near Bridgend, in Pennant rock, the so-called Beaumont borer, two together, each having cylinders 4 in. diameter, and 6 in. stroke, are making in a level, with 15 men, a speed of from 12 to 13 yards weekly.—(2). At Cwmbrain, in nearly the same kind of rock, two of McKean's borers, cylinders 4 in. diameter, stroke 6 in., with 15 men, have driven 15 yards weekly; while (3) at Port Skewett, with 15 men, two of Geach's borers, cylinders 4 in. diameter, 4 in. stroke, drilling in Pennant rock, make a progress of 14 to 18 yards weekly.

Thus tabulated in order of driving speed—

2 Geach borers make	... ...	14 to 18 yards weekly.	
2 McKean ditto	... ...	12 to 15	ditto
2 Beaumont ditto	... ...	12 to 13	ditto

Then why will my brothers pay 1000*l.*, or even 100*l.*, to ascertain the merit of the Beaumont borer? In these three instances the merit of each borer, if it be wholly confined to the boring machine, is conclusively summarised. Let them rather subscribe their money to clear away their own ignorance of existing facts, and not for the purpose of being shown the way to work ground with a particular boring machine, although its paternity may be rightfully or wrongfully ascribed to a M.P. of "Lunnun town." JAN JEAK.

THE NASCENT COPPER COMPANY.

SIR,—My letter of last week has caused a somewhat heavy series of questions as to the constitution and objects of the company, and, with your permission, I will endeavour to respond to one and all through one channel—your valuable Journal—to which I can refer my correspondents. In my former communication notice is drawn to the fact that large and convenient works have been offered to us, and accepted provisionally, that is to say, subject to the consent of shareholders in general meeting; and also to arrange at the same time, and by the same members, the proportion of cash and shares to be transferred to the vendors to complete the acquisition of the property. No one can complain as to any unfairness on this point, as it is left entirely in the hands of the parties representing the company. On this point one of the, if not the, most important features in works of the description for which these are received is convenience of transport of material, and as carriage by water is cheaper than by land the former is naturally preferred; we are highly favoured in this respect, for we have not only a good main road passing the gates, but a substantial quay extending a long distance into one of the finest rivers in the West of England—the Tamar, in which vessels have moored with a cargo of 250 tons to my knowledge, quite sufficient for all requirements.

The works are enclosed within walls, and comprise furnaces with their complement of flues, &c.; entering from the road, we find on our left hand the assay office, blacksmith's shop, kettle and engine rooms, and reviving, flowing, and refining furnaces, numbering (as near as I can recollect) 16 and 10 kettles, also a blast-engine, boiler, two precipitation and two lixiviating tanks; at the end of the yard are two more furnaces and a large water reservoir; on our way to the entrance we find on our left (that would be on the right going up) large drying floors, heated by three fires, capable of taking 25 tons, with an entrance thereon from the road, then come five more furnaces (making a total of 23), large assay office (supplied with all the necessary plant), offices, with stores beneath, salt and coal sheds, and ample open air space for stock.

Having roughly sketched quay and works, let us pause awhile and consider what improvements are required in the future to make this one of the largest manufacturing enterprises in the county; in the first place ore and furnaces are the necessary commodities, and must have our earliest attention; now, both can be had if cash is at hand to obtain them, and likewise to pay for such machinery as may be acquired. Of the latter, a crusher above the level of the furnaces, and tramroad from thence to ship side would be a desideratum, as all material could then be hauled up by the same engine that works the crusher, and by this means save all that expense entailed by the hiring of horses and carts. Provided, of course, that the capital is fully subscribed for, the propositions for our guidance are the increase in the quantity of the ore treated, to do which it is necessary to alter some and renew other furnaces; while this is being done, to raise crusher and make tramroad, so as to be in the position that all can commence working at the same time. These alterations, however, will not interfere with the returns, which, as heretofore, will be kept going. Notwithstanding the profits that accrue from the small quantity treated per day, the scale is too small to be of actual benefit to a company, and therefore increase of ore, furnaces, and I might say everything must be had. When this is completed we may depend upon handsome remuneration, and as time goes on the shares will prove to be of no small value, for from my own experience of the Nascent process I am certain of its proving most profitable if carefully manipulated.

The question having been put to me why the former proprietors, under these circumstances, desire to part with the works? I, in answer, reply that their capital not being sufficient, stoppages have occurred through want of ore, which soon tell against the management, and cripple them to a certain extent. We should not be troubled in this way, for having the money we could go into the market and purchase as smelters, and at standard rates. One more point, and I have done with the works for the present. There are a certain number of hands employed by day and night, receiving ore, weighing and salting same, and charging and drawing furnaces, and washing out and precipitating the metals; now, if at least eight times the quantity is treated per day beyond what is done, not more than three times the number of men will be required to turn over the stuff, and I am sure any common-sense man will directly perceive the increased amount of gain to the company that will result from the alteration. It is this fact that makes the process so applicable to the poor copper ores of the district, for which heretofore there has been no sale.

I must trespass a little more on your valuable time and space, and give an outline of the process as laid forth in a lengthy report some months since, and now in full operation at the Nascent works. In the first place, the process is in some respects similar to what is known as the chloridisation process, and which was introduced by Longmaid many years ago for the treatment of iron pyrites. This consisted in the roasting of the pyrites with common salt, the sulphur of the ore becoming converted by heat and oxygen into sulphuric acid, which then unites with the sodium of the salt to form sulphate of soda. Henderson subsequently perceived that the same reaction would occur if the cupriferous pyrites imported from Spain for the manufacture of vitriol were roasted with salt after the burning for vitriol, and that in such case the chlorine liberated from the salt would unite with the copper contained in the ore to form chloride of copper, which could be washed out by water and weak hydrochloric acid, the solution being then brought into contact with metallic iron so as to precipitate the copper. It was also found that traces of silver and gold were frequently present in the solution, and ultimately Claudet perfected a method of separating these metals by adding an equivalent proportion of iodide of potassium to the liquor, whereby the precious metals were precipitated previously to the copper. This industry has now attained important dimensions, upwards of 300,000 tons of burnt pyrites being annually treated for the copper they contain, and in many cases the traces of silver and gold being also extracted, while the residue, which consists chiefly of oxide of iron, finds a ready sale as a material for the fettling of iron furnaces and other similar purposes. What was formerly an utterly waste product is thus converted into a source of great profit and utility. What Henderson's and Claudet's methods have done for the poor ores of Spain and Portugal the Nascent Copper Process is intended for similar ores in this country.

In the case of ores composed of copper, a little silver, arsenic, and tin, the whole is roasted to expel the arsenic, which on cooling is deposited in the flues, and eventually collected and disposed of as "arsenic soot;" when this is effected the ore is withdrawn from the furnace, intimately mixed with about 10 per cent. of salt, and crushed to a fine state, in which condition it is ready for a further roasting in the chloridising furnaces. This second roasting has the effect of converting the copper and silver contained in the ore into chlorides, and for the purpose of extracting these the chloridised ore is removed to the precipitating house and placed in large tanks, and thoroughly lixiviated with hot brine, which has the property of dissolving chloride of silver, as well as the chloride of copper. The liquor is then run off into second series of tanks, filled with scrap iron, which at once precipitates the copper in a metallic state, and this in its turn precipitates the silver, so that the resulting precipitate which falls to the bottom of the tank consists of metallic copper and silver, mixed with a little oxide of iron and other foreign substance. This, when collected and dried, is packed into bags and sold to the smelters. The ore from which the copper and silver have thus been washed out is then stamped and dressed for tin in the usual manner. The precipitate usually contains 60 to 65 per cent. of copper, but the silver contents vary considerably, sometimes being as little as 70 ozs., and sometimes 300 ozs. per ton. This depends upon the richness in copper of the ore treated—if, for example, the ore were to contain 5 ozs. of silver per ton and 2 per cent. of copper, it would take about 32 tons of ore to make 1 ton of precipitate, and consequently the latter would contain $32 \times 3 = 96$ ozs. of silver, whereas if the ore only yielded 1 per cent. of copper it would require 64 tons to produce 1 ton of precipitate, which, however, would contain $64 \times 3 = 192$ ozs. of silver. I hope this little outline will be understood, and my mention, in conclusion, that 1 per cent. ore can be profitably treated by the process. THOS. H. MILLER, Secretary.

Bishopsgate-street Within, London, Sept. 14.

THE NASCENT PROCESS.

SIR,—This process being about to be tried on the borders of the Tamar in the treatment of low-class ores, may I be permitted to enquire through the medium of the Journal what the cost per ton is calculated to be in the extraction of the ores, and where mineral of the class mentioned is likely to be found in sufficient quantities to supply an establishment of the kind proposed? So many processes having from time to time been tried in the immediate neighbourhood of these works, it is but fair that the public should be placed in a position to judge of the actual value of the scheme, and the likelihood of its being worthy of support. ENQUIRER.

Sept. 14.

NOMENCLATURE OF WELSH COAL SEAMS.

SIR,—I notice in the Journal of August 26 a letter signed "South Walian," in which the writer, whilst commenting upon the seam of coal passed through at the Newport-Abercarn Colliery, states that—"Every man of experience of the South Wales coal basin well knows that the 'Elled' coal at Tredegar is the self-same coal as the 'Four-feet,'" referring to the Four-feet of Aberdare. As I believe that this statement cannot be borne out by facts I shall be glad if "South Walian" will give reasons for it. I have always heard practical mining engineers with whom I have come into contact give it as their opinion that the "Elled" at Tredegar is a seam above the Four-feet at Aberdare. CARBON.

LEAD MINING.

SIR,—The amount of money invested in British and foreign mining in this country is of very great magnitude; and, indeed, such as never was equalled in the financial history of the world before; but it is very remarkable, and, so far as our knowledge goes, almost unaccountable, why lead mining in the British Isles has not received the encouragement which it ought. The area of lead-producing country in the United Kingdom is prodigious; and nowhere else that we are aware of, except perhaps Colorado and Nevada, is the same proportion of silver to the ton of lead ore produced as in Cardiganshire, the Isle of Man, and Ireland, especially in the south of that island. The demand for lead in the United Kingdom is increasing with great rapidity, and British lead is in more request for export, but somehow a fully adequate proportionate progress is not made in production. Is this because we are not lead-producing, or is it from some other cause? The enquiry should be piercingly prosecuted, for an important branch of our industry and our commerce depends upon the issue. We are not aware that anywhere in the world there is such a prolific yield of lead ore as in the British Isles, taking area in comparison with area. The Isle of Man is, perhaps, the most productive lead-bearing country in the world, estimating space for space, and South Wales may be reckoned next; and for lead ore impregnated with silver the South of Ireland is exceedingly rich.

Why are not these riches brought up from their depths on a large and commensurate scale, instead of the work being carried on by dawdling companies, which, however profitable *per se*, effects next to nothing upon the general interests? Lead is in great request; all prospective conditions that we are aware of point to a vastly increased consumption, and we, as a commercial people, persist in importing what we have in the womb of our own Mother Land. We ought to be the exporters of lead, to the exclusions of all imports. It is true that in other countries, especially the Iberian Peninsula, lead exists, but it is not worked up, and there are many preventives, while in our own island home there are no preventives at all except our own want of enterprise. In brief, England should be, and may be if her people please, the great lead emporium of the world, and any person of mineralogical and at the same time commercial intelligence can see that, yet the marvel remains that so little capital is applied to British lead mines.

There is at present a rapidly increasing interest in this species of investment, but there are several obstructing circumstances. One of these is the clumsy way in which lead properties have been worked. Another is the expense attendant upon petty parsimoniousness. A third is the ignorance of geology and mineralogy prevailing amongst what is called "the moneyed public," which is not surprising, and is scarcely reprehensible, when we remember that the savings of this class are made by ordinary trading, manufacturing, and mercantile transactions very remote from any department of merchandise in metals or mining. Yet another cause has been the want of faith in promoters, prospectuses, viewers, and reports as to the present or proximate value of properties. A feeling has sprung up that a good report can be obtained from a mining captain or engineer by paying for it; this may have been the case some years ago, and, indeed, there were cases of the like, especially in connection with foreign mines, but this body of men have passed away into the limbo of the lost, and there now exists a class of viewers, inspectors, mining engineers, captains, &c., as respectable as any other commercial, mechanical, or scientific circle in the world. There are men whose profession it is to inspect mines and work mines, and especially lead-bearing properties, who will rank with any other body of professional men anywhere, and there is this to be said for them that, on the whole, they know their business better than other professional classes.

We all have experienced what a misfortune it is to get into the hands of incompetent physicians, lawyers, accountants, clergymen, &c., and the country has fearfully suffered from incompetent naval and military officers and *quasi* statesmen; but we will dare to say that any investor can find 20 men thoroughly competent and candid to make a faithful inspection and report of any lead mining property in the three kingdoms. There is, moreover, this advantage in connection with the class of investors to which we refer, that whereas lawyers, doctors, and surveyors are intolerably expensive to the individual, and military, naval, and State blunders most injurious to the State; an error in the estimate of a metallic property costs little, and is easily corrected. We believe that an era of more confidence is opening up, and that such confidence is justified by the higher sense of duty now prevailing among mining captains and engineers, their very superior intelligence as compared—perhaps we might say contrasted—with the past, and the high professional honour now constituting the *esprit de corps* of this able and skilful class of men.

Undoubtedly one of the chief obstacles to mining investment in general, and the employment of money in lead mining, notwithstanding its present attractive condition, is the heavy losses of the British public in connection with foreign Government loans. This has been in a general way noticed by us in former numbers of the Journal; it was impossible then to obtain the data now in our possession which would supply any correct view of the loss of disposeable capital from this cause. Bondholders like most other commercial and monetary classes are finding *media* exclusively their own through which to make known their troubles and their triumphs, and in collating with some labour all the contributions to the press, and the private communications to which we have had access, it is obvious that the losses of our capitalists have been very heavy. During the month next ensuing the value of dividends payable here is about 2,000,000*l.*, but in the same month last year they were two and a-half times more, making on the October showing a loss of 36,000,000*l.* a year were every month to be as decided a blank. The estimate upon the whole year, however, shows a loss of slightly less than 20,000,000*l.*, but calculated by the Bondholders' Register at nearly 4,000,000*l.* more; there are, however, considerations we respectfully suggest left out by our contemporary as to "drawings" and "bonuses," which we think will make the sorrowfully large sum of 20,000,000*l.* more near the mark. Should further losses ensue with regard to Turkey and Egypt, and should the State of Buenos Ayres or the Argentine Confederation, of which that State forms an integral and principal part, become insolvent, as many fear, the losses of English foreign bondholders will be still more disastrous.

The depreciation in the value of silver, of course, affects lead mines, a great number of which yield a percentage of silver, such as the Tipperary Silver Mines, which are really lead mines with a high rate of silver to the ton of ore, and the so-called silver mines of North-Western America. But the great majority of the lead mines of the United Kingdom are only in a small degree indebted for their success to their argentiferous deposits, so that they will not suffer. Still, lead mining, on the whole, has suffered something from the fall of the rupee from 2s. to little over 1s. 7d., as India is a great consumer of British mineral produce, especially lead. Nevertheless, the demand for lead increases; we want it, and we have it, which, however that may appear to be a contradiction in terms, is simply a correct statement. The area of our lead-producing country from Cumberland to the Land's End is vast, and from the Morian mountains, to the Galtes and the Comerns. It is probable that although the English people have smaller savings this year there will be larger investments in lead mines, because investors are driven at last to think more of home enterprise, and because something approaching to a *furore* for investment in lead mines, especially in British lead mines, is now springing up. When we consider these favourable circumstances, and make all allowance for those that are adverse, we are invited to the conclusion that a very bright day for the British lead miner is at hand. D. N.

Gresham House, Sept. 13.

MINERS' PAY—THIRTEEN MONTHS IN THE YEAR.

SIR,—It is not to be wondered at that we find adventurers complaining of the absurd innovation of the 13 months in a year system for the payment of miners, especially as the old monthly practice is in most mines retained for making the returns. The working of the present method—if, indeed, it is worthy of such a term—is most inharmonious and clumsy in the extreme. If miners and others were insufficiently paid why not have advanced their wages in a straightforward manner instead of by an ungenious concession, which in its practical working opposed itself to other parts of the system? Besides, it resulted in an advance of about 8 per cent. in the labour department of mines without being considered as anything more than a grudging concession to popular rights. The monthly system has always obtained in our metallic mines, except in mines of iron, and found to work very well, and everyone knows that four weeks are not a month. The division of the year into four and five-weeks months respectively was, no doubt, conventional for the purpose of having the pay-days at or near the end of the week, as the market days in most mining localities are usually held about that time. I do not see what the weekly system has to do with mining, it never was a weekly system; and if the five-weeks month had got to be looked upon with disfavour by those receiving monthly wages, their objections would have been unanswerably met by proposing and adopting the calender months system. The five-weeks months were never of advantage to the adventurers, nor does any advantage accrue to them from having the pay-days on Saturday. Indeed, I think the calendar month system would do away with many abuses in mines. Can anyone inform me of what good the monthly survey system is in mines as practised in Cornwall for letting the bargains and tribute pitches? Why not let to the men when the bargains are measured, and let them work on instead of coming to a standstill 13 times in a year, which causes an immense sacrifice of time and loss to the mines, and should be to the men themselves?

If fair estimates were made for the work, and the men seriously informed at the time of taking their contracts that no advantage would be taken of their dilligence and success in the accomplishment of their work, but that fair prices, according to appearances, would be given to them again irrespective of the past, whether good, bad, or indifferent wages had been earned, and no allowance made for indifferent earnings, but a fair price, according to the honest judgment of the agents, would be given under all circumstances. It is not to be doubted but that the men would be first to complain of the rigidity of the system. It would please when it went well with them, but not so if adversely. That the Cornish tutwork system has worked itself into a bad groove no candid person acquainted with it will, I think, attempt to deny, and the blame, though in different proportion, belongs to the three parties interested—the adventurers, agents, and workmen. To set an arbitrary limit to individual workmen's earnings under the contract system was virtually to sap its foundation and defeat the object it was ostensibly intended to promote. That the agents would do this of themselves is not for a moment to be supposed, as the majority of them are practical men taken from the ranks of working miners, and know by experience how banefully such a course operates. The men themselves have had much to do with bringing about that reprehensible state of things by their moving appeals for some consideration in respect of unremunerative contracts when they occur, and the agents themselves are not to be held blameless in according to a practice the tendency of which a moment's reflection would have convinced them was to operate injuriously to all parties concerned. Most of the blame lies here, especially with the parties of the first part, as I find it hard to get men, especially Cornishmen, out of this groove, even when they know and admit they have fair prices in sight if their past earnings had twice exceeded the average. In speaking of this some little time since to one of my workmen in respect of a coterie of practised grumblers we had in the mine, he at once replied—"If I had a fair price in sight, however badly it might turn out, I would never complain, but get through with it as quickly as possible, and hope for better luck next."

Some time after, speaking to the same man on the same subject, I

remarked that the chances incidental to a pure contract system operated both ways, sometimes in favour of one party and sometimes in favour of the other, so that if adverse fortune attended him at one time it was almost certain to change and make in his favour. "Ah, but," said he, "there is nothing like a steady thing for a family." The inference from this is, and it expresses the whole truth, that a steady average wage is desired to be made up when the men do slight, and the unsteady, or higher wage, when there is a chance of making it. There is a one-sidedness with the Cornish miner which no one else seems to partake of. It is the truth, and not a trivial one, and should be strenuously opposed and counteracted. The result would be as beneficial to the miners as it would be to the mines.

The part the adventurers have played in the matter has principally been performed by little local shareholders. Querulous, illiberal, and consequently narrow-minded, whose assumption is that if more than an average rate of wages has been earned by the men in mines in which they are interested they jump to the conclusion that the agents are not sufficiently attentive to the adventurers' interest, or else are incompetent for their office, whereas the truth is they are generally of the better class. The best thing that agents can do under such circumstances is to mercilessly snub those little meddlesome obstructives. Agents have no need to submit to be tortured as toads under a harrow; there are none too many in the country well qualified of their class, numerous as is the catalogue of pretenders and aspirants to office. I shall only now add that the framers of the 13 months in a year system have created and hung around the neck of mining a millstone, a revolving dead weight, which so long as it is tolerated will continue to repeat itself, and work its consequent mischief.

INGENIA STAT SINE MORTI DECUS.

THE CARDIGANSHIRE MINES, AND THE GOVERNMENT INSPECTOR.

SIR,—Permit me to call attention to an abuse that does not seem to meet the attention of the parties interested in the working of the mines, of the proprietors of the land, or the gentlemen referred to; but which, nevertheless, exists extensively throughout the county—which is the neglect of keeping a proper plan and section of the works at the office of the company, as required by law. If this were properly attended to and enforced I am certain it would save many a mine from destruction, which would inevitably be the case without them—and to this cause I consider we may attribute not only a small but a very large portion of the stoppages of the mines in this county. To work a mine without a plan I have before pointed out is precisely the same as a man navigating without a compass; he may possibly go right, but there are 99 out of 100 chances of his going wrong. I trust this letter, by appearing in your valuable columns, may have the effect of remeding this gross evil.

Goginan, Aberystwith, Sept. 11. ABSALOM FRANCIS.

EAST GOGINAN.

SIR,—Perusing the reports of the different agents in the prospectus now before the public, all of high repute in the mining community, I really must say I do not understand why it should cease to work. The late manager, Capt. James Paull, says there is a lode gone down in bottom of the deepest level west worth 1¼ ton per fathom for 24 fathoms long; this if found so good in the next level will produce over 700 tons of lead ore, the eastern end being more valuable. In driving the 80 east only a few fathoms will enter the ore ground gone down in the 56, which is worth from 15 cwts. to 1 ton per fathom, and is 24 fathoms high; take this at 15 cwts. per fathom you have near 300 tons, this with the above 700 will be 1000 tons in those two places alone, and there are some half-a-dozen points in the mine equally as encouraging. The state of the mine is such as to pay cost very soon, and in a very short time in all probability to pay 20 per cent. interest, and increase as ground is being made available for taking away. This is a legitimate undertaking, and not a mere speculation, and whoever the fortunate shareholders may be there is not the least doubt they will be well rewarded for their outlay.

A TWENTY-FIVE YEARS SUBSCRIBER TO THE MINING JOURNAL.

WHEAL GRENVILLE, AND ITS MANAGEMENT.

SIR,—Mr. Lane thinks my letters are almost beneath his notice, and yet he makes an effort to dispute my statements by showing the result of his last six months' management as compared with those of seven months (from February to August, 1875) under the former management. The latter, he says, is not taken from the books, but from the published statements. I have taken the trouble to refer to those statements, and find the result to be very different to what Mr. Lane says. The seven sales of tin, to correspond with the seven months' costs, from February to August, 1875, amount to 4911*l.*, not 4231*l.*, as stated by Mr. Lane, showing a difference of 680*l.*, which reduces the loss on the seven months' working (if we accept Mr. Lane's statement of costs as correct) to 2507*l.*, or about 358*l.* per month. The loss on the six months under the present management, Mr. Lane tells us, is 1695*l.*, or 282*l.* per month, or 76*l.* per month less than that of the old management.

Mr. Lane enters into no particulars as to the number of men employed under the respective managements. I find that during the seven months of the old management referred to there were 100 men employed underground. At the general meeting, held in June last, the present management had 78 men only at work underground, but I see by the present report they have lately been increased to 98. Now, if we take this difference in the number of men employed into consideration, I think it must be admitted that the monthly loss under the present management is greater (even if we take the decline in the price of tin into consideration) than it was under the former management.

Another, and most important, fact Mr. Lane does not mention. For four of the seven months alluded to the old management was driving a dead cross cut to intersect the lode at the 130 from the north shaft, and they had only three months' returns of tin from this lode, which has produced, and is still producing, good quantities of tin. The present management has, therefore, had the advantage of six months' operations on this productive lode against three months of the late management. The fairer way to test the results of the respective managements would be to show the number of men employed, costs, and returns for six months since the lode was cut at the 130. To do this one must have access to the cost-sheets, which I hardly imagine Mr. Lane would grant me. The only fact I can arrive at in this regard is the amount of tin returned. The last six months under the old management the quantity of tin sold was 90 tons, the quantity returned during the six months of the present management is 77 tons. The highest monthly sale during the previous period was 15 tons, while the highest sale during the latter period has been 14 tons 5 cwts. The average price of the ore for the last six months of the old management was 49*l.* per ton, average price under the new management for the same period 45*l.* 3*s.*, showing a difference of 3*l.* 17*s.* per ton only. Though Mr. Lane has made a great effort to show that the present management is much superior to the former, I think any unprejudiced person will admit that he has failed to do so. He promised much when he advised a change of management. Has he performed what was expected of him? He found no terms too strong in condemnation of the old agents—what has he advocated in their place? One of his chief complaints against the late managers was that they spent too much money at surface in proportion to the work underground, or as he termed it on "the power-producing part of the mine." We are now told that 400*l.* has lately been laid out in repairs to the machinery alone, and yet after this heavy outlay Capt. Hodge says that breakages are of frequent occurrence. I foretold this months ago. On Aug. 9 Capt. Hodge reported that he had made certain alterations, and that the machinery was working better than he had ever seen it before. A few days after this was written a breakage took place, and the water rose to the 150. Before the mine was again drained, on Aug. 29, another breakage took place, and the water rose above the 140. Neither of these mishaps were mentioned in Capt. Hodge's reports, published in the Journal, the only public mention that I have seen of either appears in last week's Royal Cornwall Gazette.

Now, before he proposed "a cordial vote of thanks to Captain Hodge for the satisfactory manner in which he had conducted the working of the mine," my humble opinion is—though Mr. Lane may consider it "beneath his notice"—it would have been a far more sensible proceeding to have proposed an enquiry as to the cause of these breakages. The sales of tin have not increased, as I have all along said they would not without some great discovery at the mine. When the change of management took place the shares were saleable at 3*l.* each. Calls have since been made amounting to 1*l.* 13*s.* per share, and I saw in last week's Royal Cornwall Gazette that the shares had been offered at 5*s.* each, with no buyers. This is at the rate of about 1300*l.* for a property that only ten months ago had a market value of 15,000*l.* And yet the public are now asked to believe that the change of management had been beneficial to the company. It is not long since that the shareholders were assured that the only thing wanting to make the mine a profitable one was a change of management, and were promised a speedy beneficial result from the appointment of Capt. Hodge. Now the adventurers are told that it is evident the mine cannot be carried on without a loss, and even a further outlay of 5000*l.* for machinery. The discontented shareholders have got their King Stork—how do they relish his rule?

Camborne, Sept. 13. F. L. A. T. RODDA.

MINING IN IRELAND—OOLA MINES.

SIR,—I observed in the *Mining Journal* of Aug. 19 last a letter from Mr. George Henwood on the subject of these mines; and knowing Mr. Henwood's great abilities, and that he is considered a high authority, I feel satisfied he has given a fair and just report of these mines. I also saw in the Supplement of the *Mining Journal* of Aug. 26, a letter from Mr. John Champion, of Mount Hawk, St. Agnes, wherein he says he knows something about Ireland, and also about lead mining, both in the counties of Limerick and Clare. If Mr. Champion was ever at the Oola Mines none of the old miners here, or even any of the inhabitants in the locality, ever knew of it. At that time (six years ago) there were 30 fms. of water in the engine-shaft, and no lodes to be seen at surface; and I ask, is it possible that Mr. Champion *dived* through this 30 fms. of water and examined the mine *thoroughly* so as to satisfy himself and partner that the mine was not good enough to invest their money in? The eastern part of the mine at that time was also idle; the long adit, with seven shafts, was closed up, and no ladder-roads to descend into any part of the mine. I have opened the mines up, and know their intrinsic value; and this work only commenced in March, 1872, so how could Mr. Champion get underground here six years ago? I emphatically say he could not have done so; and, more than that, I say he knows nothing whatever of the mines; and it is most ungentlemanly for him to try to depreciate the value of other people's property when he knows nothing about it. I know the entire family of Champions from East Wheal Rose, and worked for 13½ years in that mine as tutwork man and tributer; the old captain, John Champion, was agent there for that period, so that no man living know him and his offsprings better than I do. I have now to state for Mr. Champion's information that Joseph B. Champion, a son of the old Capt. John Champion, was second agent at the Oola Mine under the then proprietor, Mr. Smythe; this was 16 or 17 years ago. Mr. R. Smythe and Mr. John Cash engaged me here under them, in 1872, for a new party. Mr. Champion says he does not believe that any company would suspend operations on a mine where there was a branch of lead from 12 to 18 in. wide; that may be his opinion, but can Mr. Champion tell me how a company could keep it working when they had no funds to carry on the works, and no possible means of raising funds at that time, *owing* to the depression in mining, just as it is at the present moment? This was the reason, and the only reason, of the suspension of the mine.

I do not know Mr. John Champion, the writer of the letter alluded to, but the reports of Mr. George Henwood, Mr. Thomas Tonkin, and other eminent mining engineers, who have carefully inspected and reported on this property, will bear the strictest investigation, for they have *seen* the mine since it has been opened, *consequently* their reports will be accepted by all intending investors, as well as the public at large, as satisfactory evidence of facts.

Oola Mines, Sept. 2. JOHN PHILLIPS, Manager.

NEW CONSOLS.

SIR,—This mine may with propriety be regarded as the most remarkable mine in Cornwall. It was first worked under the name of Wheal Martha, and afterwards under that of Great Wheal Martha. When Capt. R. Pryor purchased it with all the machinery then on it, the mine went by the latter name. The present company named it New Great Consols, but by way of shortening the name they have dropped Great, and it is now called New Consols. It includes another mine situate at the western extremity of Wheal Martha, which was called Wheal Sheba, or Great Sheba, and afterwards West Consols. Capt. Pryor, who purchased the mine and its appurtenances from the Registrar of the Stannary Court, had a good bargain, having given only 1350*l.* for the entire property. Many—most agents—would have availed themselves out of the goodness of the bargain by making the company give something more. Being perfectly unselfish in his character, Capt. Pryor charged exactly the amount he paid, which was about 1000*l.* under the value.

The following circumstances in connection with New Consols make the mine remarkable:—Until Capt. Pryor came into possession it was regarded as a copper mine merely, like Devon Great Consols at the eastward, so that Capt. Pryor went to work it as a copper mine, looking for nothing else. He soon found that arsenic abounded in the lode, afterwards that tin also was abundant. Of copper in the stone little has been sold by the present company, but of black tin they have sold as much as 25 tons per month, and of crude arsenic 165 tons per month. The arsenic is now refined on the mine. Owing to the adoption of a new process of separation of the constituents of the lodestuff, they now return the following metals monthly by the treatment of 45 tons of stuff daily:—Precipitate of copper, silver, tin, arsenic (refined).

The expenditure upon the vast arrangements for carrying out the new mode of dressing, &c., has been very considerable; but I find that, under the advice of the manager, they have stopped for the present the enlargement of their means of returning the ores, in order to show that a good profit can be made out of the works at the present scale. I think that it will soon be found that New Consols will yield more profit than any other mine in the county, at present prices. There is one addition to the appliances which I would advise to be made out of profits—a branch railway to connect the mine with the East Cornwall Mineral's Line. This would effect a saving of a few hundreds a year. The length of the line would be about one mile and a quarter—that is to say, from the East Cornwall Minerals Railway to the great engine. It is proposed to have a small stationary engine near the Minerals Railway to work the carriages on the branch. The fall is about 500 ft. in the mile and a quarter. The line would be double for half that length. The Mineral Railway Company's carriages would be used on the branch.—*Truro, Sept.* 13. R. SYMONS.

"GOOD OUT OF EVIL."

SIR,—It has been often said that "sometimes good comes out of evil." The present low price of metals (tin in particular) has been regarded as an evil, because it has occasioned the abandonment of numerous mines, and the consequent discharge of thousands of labourers and artizans, who have had, consequently, to seek employment in foreign lands, leaving, in general, their families at home. Evils, which I need not here detail, have attended such compulsory removals. Poverty in those who remain at home and in those who emigrate is one of the evils. But I can refer to a good resulting from the depression of the mining interest. It is this—the instruction it has given to the promoters of mines in the important moral principle of *honesty*. You know that when tin was at a high figure there was such a "rage" for mining that promoters, partly by misrepresentation or by exaggerating the value of the properties brought before the public, received as promotion money enormous sums. I have heard of the payment as promotion money of so much as 170,000*l.* for five lead mines in Wales—mines intrinsically, I believe, almost worthless! About 20,000*l.* was paid for Terras Mine—the fate of which you know; 5000*l.* was charged for East Terras sett, but so much was not paid in—only about 2000*l.* Scarcely a mine was brought out without a large sum being charged by promoters, the list of which would be a very long one. I will name one mine now at work near Redruth—I mean Penstruthal—for which the promoters charged 50,000*l.*! The old mine during its first working yielded large and rapid profits, but Messrs. Little and Co. worked it afterwards and lost 40,000*l.* But concerning losses in promoting a mine promoters are reticent, they speak of profits only. The present Penstruthal Company are operating in Lannarth, which adjoins Penstruthal at the north, but I understand that they have Penstruthal also. When I surveyed Lannarth in 1829 I observed that the "old men" had left marks of their industry in the deep grooves they had made on the lodes, and the heaps of rubbish thrown thereout, marking distinctly the courses of numerous lodes. I received at the time an impression in favour of the site as a good one for mineral operations, but little or nothing was done in the lodes, which are numerous, before the present company took the sett. The mine is doubtless a good speculation, but not so good as to warrant a charge of 50,000*l.* or any sum for the lease.

At present, in proof of the good resulting from the depression in mineral produce, the promoters of some mines are asking the public to come into the adventurers on the original honest plan—*i. e.*, without the payment of any premium. I notice in your Journal two such mines—one mentioned by Mr. J. Y. Watson in a recent number of the Journal, and the other called East Tresavean, advertised in your last number. That is an honest and fair way to work mines, putting all concerned to stand on the same footing. East Tresavean is a name that was applied to a mine near Bessow Bridge, but I presume that the mine referred to in your Journal under that name is nearer Tresavean Mine. The advertiser would do well to give the name of the estate and of the lord, that your readers may know where the mine is situate, and so judge for themselves as to its value or prospects.—*Truro, Sept.* 12. R. SYMONS.

[ADVERTISEMENT.]

BRITISH MINING INVESTMENTS.

SIR,—We feel it our duty to, in every possible way, impress upon capitalists and investors generally that they should not longer delay in making their selections of shares in sound British Mines. We do not now instance any particular mine or mines, although, of course, the nature of our business causes many concerns to be brought under our notice, and we take into consideration none but those which we can conscientiously recommend to our clients; but would urge upon investors the advisability of taking advantage of the depression which now exists, and, as we have pointed out in our "Investment Circular and Financial Record" for the present month, to make their purchases speedily, for there is no doubt that the tin market has been to its lowest, and any movement must be to the advantage of shareholders. A few years since tin dropped to 40*l.* per ton; half the tin mines had to be stopped, and the ruin of Cornwall was predicted as a certainty. Yet in an incredibly short space of time tin mines again became the rage, and tin advanced to nearly 100*l.* per ton. If mines continue to be "knocked" at the present rate, we must soon see a great reaction, for there will be but comparatively little tin raised in Cornwall. That will necessarily be so much the better for those who hold on; for a reduction in the quantity of tin produced, and the consequent discharge of miners, will at once raise the prices of ore.

There never was, perhaps, so favourable a time for buying into both good dividend and promising progressive mines as now presents itself. Many shares in such mines, from the number thrown on the market, are to be bought at very much less than their real value; and if the anticipations of an improved price for tin ore, which rest upon very reasonable grounds, be realised—and the markets are already becoming firmer—investments made in such shares at the present depressed prices must become very profitable. We could name many mines the shares in which are selling at merely nominal prices, which are so thoroughly good, and the expense of working so light, that a very slight rise in the standard would at once put the shares up to a price that would prove very remunerative to those who bought at present quotations. Our experience shows us that investors too often wait until the shares have risen, and then buy on the top, or very nearly so, of the market—thus failing to realise the large profits they might have obtained had they promptly acted upon the advice of their brokers, and bought at an earlier period. It naturally stands to reason that men whose business it is to study the market in all its phases, and who are in daily—and, if needs be, hourly—communication with the principal mining districts should be in a position to judge as to when would be the most judicious time to buy into or sell out of any particular mine.

Our advice to investors is to pay yet greater attention to good British mines, for there is no other class of investments which make such profitable returns; and in thoroughly sound concerns the security is undeniable and the risk infinitesimal, and we feel confident that all who promptly follow our advice will at no distant date give us credit for the soundness of our judgment.

ARCHARD JONES AND CO., Stock and Share Dealers.

7, New Broad-street, London, Sept. 15.

THE WILD DUCK, OR SPORTSMAN'S ARMS.

"Well, sose, before we begin business, we'll jest wash down the denner, and I'll tell ee something about Uncle Sammy Rowe," says Uncle Henry Treylon. "Oh, come less hav'n," says Jan Temby, "but where's old Tom?" "Never mind," says Uncle Henry, "he'll be sure to smill the denner? Well, Uncle Sammy's blacksmith's shop was right opposite the end of Passon Rechards's house, in Camborne, and you would always see a lot of old hosses there, some lame and some blind, waiting for shoes or fastness. In they days there wor hundreds of moyles (mules) in the country, for all the ore wor carried in sacks on moyles backs, from all the bals to Hayle and Basset's Cove; and when a drove of moyles come to Uncle Sammy's shop for new sets of shoes; oh, my dear life, that wor the time, like a fair day, and you'd find it hard to reckon the pots of beer. Uncle Sammy always had a great notion to see Lunnun, and get a bottle of the Thames water to cure the toothache, for a traveller told 'un it wor so good as the River Jordan water for toothache. Uncle Sammy had lots of shares in bals, amongst the rest was Wheal Vylet, down below Camborne. This bal was always expecting to cut rich, and one day, while Uncle Sammy was shoeing a drove of moyles, a man come running like a mazed man, and so soon as a had breath to speak, a screech'd—'Uncle Sammy, my dear Uncle Sammy, do ee know your fortin is made for ever, and ded'nt ee heer the news? Why, Wheal Vylet is cut rich.' 'Do ee say so?' says Uncle Sammy. 'Why, iss, to be sure, I'm now this very minnit coming from there.' 'It's what I always expected,' says Uncle Sammy, and stooping down and picking up the shoeing-box and tools, he tossed un over bang again the end of Passon Rechards's house. 'There,' said he, 'stop there till I send for ee, I've done with ee.' And caalen all the boys—his sons wor all smiths—'Now, Johnny, my son,' says he, 'all our fortins are made. Now, mind what I tell ee, Johnny, Billy, Dick, Sammy, and Jimmy, after a bit we must keep different company, and break off old acquaintance little and little; you can play and talk with the same boys you used for a few weeks, and speak to the same poor neighbours till I come back from Lunnun, for I'm off to morrow.' 'But,' said the drivers, 'who's going to shoe our moyles?' 'You and your moyles,' says Uncle Sammy, 'may go to the d——l for what I care'—he was religiously inclined—'you seem to forget I'm a gentleman.' Well, sure enuff, Uncle Sammy went to Lunnun, and got a bottle of Thames water; and when a come the people from all parts of the parish wor running in droves to see the great traveller. Jacky Hocken ax'd where he put up to in London. 'Why,' says Uncle Sammy, 'I stopped at the sign of the Black Boy and the Apple Tree, the first publichouse right hand side coming in town, and 'twas fair-day all the time I wor there.' 'Ded ee see any shows?' says Jacky. 'I see'd the theatres,' says Uncle Sammy, 'and the hopperas, and I see'd the Beggar's Proar.' 'Why you need'nt go to London to see that,' says Jacky, 'for you may see that any time when the cracks get a sturt up to Stray Park.' A few days after Uncle Sammy's return he heard that Wheal Vylet was not looking so well, and to make sure he got Capt. Gilbert Whitenin to inspect the mine. It was said that Capt. Gilbert could not write; but, no matter, after he had seen the mine, and he and Uncle Sammy wor drinking a pint of toddy together, 'Now, like a honest man,' said Uncle Sammy, 'tell me the truth, Capt. Gilbert, about Wheal Vylet.' 'I will,' says Gilbert, 'tis a bal turned upside down, by G—d, and not worth a puff of tobacco.' Poer Uncle Sammy had to pick up his shoeing tools again, and said, 'It was lucky, my sons, we didn't give up speaking to the poor neighbours, but the new fashun way of shoeing I picked up in London will pay for all.' And the wonderful accounts of his travels highly amused his friends as long as he lived. It is said he performed wonderful cures of toothache with his Thames water." Cousin Will remarked that he knew Uncle Sammy's sons very well, they were

respectable tradesmen, and that the account of Uncle Sammy and Wheal Vylet, and the journey to London, was quite true. "Crack," from a hoarse voice, "was a nickname of some families of able miners; they frequently got good sturts at Stray Park Mine, and then on pay-days there generally used to be a great row and uproar." "Now, Uncle Henry," says Cousin Will, "you are the oldest man here, do you know the ancient name of Dolcoath Mine?" "No," was the reply. "Well, it was Bullom Gairn. Bullom is a wild plum, and, no doubt, the valley district was at one time all gardens and orchards, hence the name. Then there is Dunkin's Gairn, or Dunkin's Garden. This little valley, extending to Pengeggon, Waterstyle, and Tuckingmill, was originally gardens and orchards, but they must be rich gardens to compare with the mineral treasures which have been extracted from underneath those spots."

"That's true," says Jemmy Dowa, "and I never heer'd purtier discoose than that in my born days. Why, old Tom, come art, a." "Iss," says Tom, "but I was too busy eating to speak a word, and there's fine fellowship in eating and drinken." "So a ess," says Jemmy, "but hasn't a anything to say to they men here?" "Chaarly Hicks, the ostler," says Tom, "was out of a job, and axed Jan Sleggan to recommend un to a place. 'Iss sure,' says Jan. 'I know a place will suit thee fine and fitty sure enuff, and I spose a ess the best place in the county for a ostler.' 'Where ess it, my dear Jan?' says Chaarley. 'Why, down to Portreath to be sure,' says Jan, 'for all the capns of the ships put up at the hotel down thear.'"—*Cousin Jack's Unpublished MS.*

IMPROVED ROCK-BORING MACHINE.

Machines constructed, according to the invention of Mr. J. R. SCHRAM, of Norfolk-street, Strand, have only four moving parts—the piston, the slide-valve, the slide-valve rod, and a cog for twisting the piston, and its drill or tool. The piston has packing rings and bearing surface in two places, some distance apart, the intervening portion being smaller in diameter; it is formed in one piece, or continuation with the ram, which passes out at the front or lower end, there carrying the boring tool, and with the back part which is formed with helical grooves, and enclosed in a hollow head; the acting back area of the piston is larger than the acting front area. The slide valve is of ordinary construction as regards the face or port part, but is held between flanges of a double piston, each end of which is working in a corresponding cylindrical part of the slide-jacket, its stroke being limited at each end by the said flanges or conical faces on same coming in contact with one or other of the edges of said cylindrical parts of the slide-jacket. A cog on a small piston works in a direction vertically to and into the helical grooves of the back part of the piston or ram. The construction will probably be best understood by describing the action of the machine. Supposing the slide-valve is in its extreme forward position, then steam is admitted to the pump of the main piston by a port. When the main piston has gone back part of its stroke the steam is allowed to escape by a small extra port to the back piston of the slide-valve, the steam behind the other or front piston of the slide-valve at the same time being allowed to escape into the exhaust passage; the back steam-port will thus be opened, and force the main piston forward, imparting the necessary blow on the rock. This steam in the forward stroke is similarly allowed to escape by an extra port or passage to the front piston of the slide when the main piston has gone part of its travel, and the slide-valve will thereby be reversed as before, the steam on the back piston of the slide-valve also escaping into the exhaust as before.

As soon and as long as steam is working on the back part of the main piston, the aforesaid piston with the cog on is lifted free of the grooved back part of the main piston, which thus performs its forward stroke without turning and without touching any other part, in consequence of which the blow is powerful; but in the back stroke steam is by a small passage admitted above the cog piston and forces the cog into one of the grooves, thereby giving the main piston and the boring tool a twist in each back stroke. Instead of this he sometimes fits or forms the piston with ratchet teeth, and the cog piston is made to press upon a pawl gearing into the ratchet teeth, thus turning the main piston. The piston has a constant steam or air pressure on its upper face through the passage which communicates with the slide jacket. When steam is admitted to the main cylinder the pressure on both sides of the cog piston is equal, and as the main piston makes its down or forward stroke the pawl slips easily over the ratchet teeth of the main piston, but when the main piston makes its up or back stroke it is forced to make a slight turn. The small steam passages are so drilled and arranged that they can be cleaned by removing stop screws. The feed is done by hand, Mr. Schram having found by experience that automatic feed is not suitable for general work owing to the variable nature of the material operated on.

MANUFACTURE OF WHITE LEAD DIRECT FROM THE ORE.

The efforts to shorten the process of manufacturing white lead, by producing it direct from the ore instead of re-carbonising the pure metal, have been very numerous, but the old process has hitherto been considered far superior to any of the proposed innovations. A process, however, has recently been patented by Mr. J. C. MARTIN, of Richmond, which it is thought, will really be efficient as a wet process of manufacturing the lead direct; it consists in precipitating by means of carbonic acid gas carbonate or white lead in a non-crystaline condition by employing a saturated, or nearly saturated, solution of a neutral salt of lead as the acetate dissolved in water (instead of using the largely diluted solutions of basic salt of lead, as heretofore recommended), a further quantity of oxide of lead added gradually being held in mechanical suspension in the solution, and which, becoming dissolved on the temperature being raised, produces a sufficiency of the basic salt to set up and continue the necessary chemical reactions on the introduction of the carbonic acid, or he dissolves the oxide necessary to maintain the density of the solution separately, and causes it to flow into the precipitating vessel. He also carries on the decomposition in presence of metallic lead in a form that exposes the largest amount of surface to the solution, by which the resulting carbonate is produced of a pure white lead. Now, obviously it would matter little whether the solution were obtained from the ore or otherwise, provided that it can be obtained cheaply, and there are some owners of low-produce lead ores in the western counties who anticipate that the invention will tend to augment their profits.

The discovery which Mr. Martin has made is that to precipitate white lead in a non-crystaline condition from oxide of lead dissolved in acid diluted with water, forming a solution of soluble salt of lead, entirely depends on the proportion the acid solvent bears to the quantity of water in such solution. If the water is in too great excess, and the acid deficient, a large amount of basic salt of lead will, as is well known, be formed; in that case the precipitating carbonic acid combines with so much energy as to produce a crystaline deposit, and this has been the chief cause why all attempts to produce white lead by means of precipitation equal in quality to that made by the old or Dutch process have hitherto failed. When, however, the acid solvent is in a greater proportion to the water less basic salt is produced in the solution, and the combination of the carbonic acid takes place with less energy in presence of the larger quantity of acid solvent of the lead oxide which it has to displace before the carbonate of lead can be formed, and this is then precipitated in a perfectly amorphous and non-crystaline condition.

The precipitation is carried on in a vessel placed at a suitable elevation until a considerable quantity of carbonate is held in mechanical suspension by the action of a revolving agitator, when the whole or part is run off into a second vessel, and the carbonic acid passed through the solution in this until it shows an acid reaction, when it is forced under a strainer placed in a separated vessel, and through which the clear solution rises, leaving the white lead on the bottom, which is constructed to be readily detached. The clear solution passes to the precipitating vessel, and the white lead is removed and washed in a series of vacuum boxes or strainers placed one above another, and arranged to be readily elevated, the washing liquor passing through each from the upper to the lower, thence to an evaporator to be concentrated, and from this to the first precipitating vessel. The white lead is afterwards dried and finished for the market in the usual manner.

In carrying out the invention Mr. Martin makes a solution of the neutral acetate of lead in water, in which the weight of the water is about one and a half times or less that of the crystalised acetate; or he makes the solution with the equivalent quantities of acetic acid, lead oxide, and water, and in a vessel by preference of a circular form, fitted with a revolving agitator, he places (say) 3600 gallons of this solution, temperature being about 60° Fahrenheit, and he suspends or places in the vessel from 4 to 6 tons, more or less, of metallic lead in any form that will cause the exposure of the largest amount of surface, or he granulates or reduces to small pieces the whole or part of the lead, and agitates it with suitable projections fitted to the agitator. He then adds about half a ton or less of oxide of lead, by preference litharge, passing a current of carbonic acid gas through the solution until the oxide has become converted into carbonate of lead of a sufficiently white colour, which if the flow of gas and the agitation has been sufficient will occur in about an hour, more or less. He the adds an additional half ton of litharge, continuing as before, and if the lead oxide does not readily dissolve he gradually raises the temperature to 90° or 100° Fahrenheit. When the contents of the vessel have again become of a sufficiently white colour he adds a further quantity of about one ton of litharge, and if the conditions of the decomposition and conversion have been well observed this quantity may be added during each hour until as much has been converted as the vessel will contain. Instead of adding the successive quantities of litharge to the solution as described the said litharge may be passed into the solution in a regulated continuous stream throughout the same time.

When the requisite condition of the white lead is obtained he passes the solution containing it through a filtering press, or through any suitable filtering material or apparatus capable of separating the white lead from such solution; or having run off the solution he allows the white lead to subside and return the clear solution to the decomposing or converting vessel first described for re-use as before. The white lead having been freed from as much of the solution as can be conveniently separated is washed in as little water as possible. He effects this by placing two, three, or more quantities of the white lead in separate vessels or apparatus, and the water used for washing one is used upon the others in succession, and as the operation proceeds and the quantities are changed fresh water is applied to the quantity most washed and afterwards to the others, and finally to a quantity of unwashed material, a process well understood in other manufactures. The operation may be conducted in boxes having a suitable filtering material placed a short distance from the bottom, and under which a partial vacuum can be produced, or vats allowing the several washing waters to settle and be run off may be used, or it may be conducted in any other convenient manner. If at any stage of the washing operation a portion of the white lead from its finely divided condition passes the filtering material, or will not readily subside, he passes a current of carbonic acid gas through the water, or add to it a small quantity of soda crystals (carbonate of soda) in solution.

The process appears well calculated to give satisfactory results in practice, and if it can be so modified as to be applicable to the treatment of poor lead ores the inventor may anticipate a very ample remuneration for his ingenuity.

FOREIGN MINES.

ST. JOHN DEL REY.—Telegram from Morro Velho, dated Rio de Janeiro, Sept. 12: Produce for the month of August, 39,000 ozts.; yield 7·6 ozts. per ton.

RICHMOND CONSOLIDATED.—Telegram from the mine at Eureka, Nevada: Week's run, $50,000. One furnace under repair. Boilers repaired.

SWEETLAND CREEK (Gold).—Telegram from G. D. McLean: Gross returns of run just made, $14,000. The profit is $3500. I send you a remittance of $3000.

EBERHARDT AND AURORA.—The directors have this day received a further remittance of bar silver, valued at present price at about 5000*l.*

— The directors have received advices from Capt. Drake, stating that the mill recommenced working on Aug. 21, and he proposed continuing the run until Oct. 1: 2500 tons of assorted ore on the dumps.

PORT PHILLIP AND COLONIAL.—Telegram, dated Melbourne, Sept. 1: Month ending Aug. 18—Yield per ton, 4 dwts. 12 grs. Stopes unaltered. Profit, 705*l.* Western No. 10 level greatly improved.

SIERRA BUTTES.—Result of the working at the Sierra Buttes and Plumas Eureka Mines for August:—Sierra Buttes Mine: Receipts, $19,519.—Total California expenses, including cost of mining and milling, $22,984.—Plumas Eureka Mine: Receipts, $35,630; total California expenses, including cost of mining and milling, $11,134; tons of sulphurets saved, 45; tons of sulphurets amalgamated, 73; yield of sulphurets per ton, $52.

CHONTALES.—Mr. Danby, August 5: Quantity of gold extracted 140 ozs., the produce of 630 tons crushed in 14 days; working average, 4½ dwts. Cost for the month, 536*l.* 8*s.*; value of the gold, 380*l.*; loss, 156*l.* 8*s.* We have mined and brought to San Domingo mill 995 tons of quartz, and treated 630 tons, giving an average of about 4½ dwts., so the balance of 360 tons will give a value of some $1000, together with the tailings saved, and had the new machinery, spur wheel and pinion, and the pans been here we should have made a handsome profit on this small amount of quartz brought to mill. We have not been able to crush more quartz at the mill, owing to the want of the new spur wheel and pinion ordered some months ago. The old one, as I reported previously, was worn out when I came here, and there was no other to replace it, so I have had to repair it in the best way I could, and it is only with the greatest care that it has been made to run as long as it has. We have been delayed by this over a fortnight, having to put in 28 new wrought-iron temporary teeth. Although I have heard nothing further of the Wheeler pans from San Francisco, yet I have dispatched a man to Virgin Bay by the up steamer from the lake, and thence to San Juan del Sur, to arrange for their transit overland. I cannot hold out any favourable promises until the new machinery has arrived.

JAVALI.—The directors are happy to announce that they are in receipt of advices from the mine, confirming the telegram received from the manager on August 18, of which the following are extracts:—"The mill worked 24 days, crushing 2055 tons of sand, yielding 496 ozs. gold. From the blankets I collected 82 tons of sand, which, after treatment in our amalgamators, yielded 143 ozs. of gold, making together the excellent result of 639 ozs.—an average yield of 6 dwts. 5 grains per ton. The expenditure has been 916*l.*, including 145*l.* for capital account. The remittance is valued at 1750*l.*, thus leaving a profit of 834*l.*"

MALABAR.—G. B. O'Reilly, Aug 9: Mine: It is very satisfactory to me to be able to state that we have now fairly opened into the high banks to the east, and have reason to be satisfied with the general appearance of the ground as far as yet uncovered. The preliminary work of piping through the debris and getting out the larger mass of boulders which barred our way to the sound banks has been tedious and heavy; but little now remains to be done towards facilitating our access. We have already run two or three caves off the new ground, and in a very few days more will have a working 300 ft. wide by 80 or 90 ft. high to operate on. The appearance of the gravel is fairly good, and as far as we can judge by the look of the ground sluice and sluice boxes, and a few trials by pan, there is a fair prospect of our more than covering expenses, even in our first run.

For the first time in the history of Malabar we have a sufficiency of high ground to offer us a chance for continuous washing. The clean up which we expect to make at the end of this month, after a run of over 500 hours, will do much towards clearing up any doubt as to our future. We have considered it advisable not to take up the blocks earlier, in order to obtain a better idea of the value of the ground, a large portion of the earlier part of our run having necessarily been on rather poor gravel.

Pipe-Clay: As yet the pipe-clay uncovered does not exceed 10 or 12 ft. in thickness, and falling as it does from a height of 60 or 70 ft. breaks up of itself in a great measure; we do not anticipate any great difficulty now from this source, as the pipe-clay bears but a small proportion to the gravel, and is easily disposed of.—Bank: The bank is now about 90 ft. high, with the bed-rock rather dipping in than rising, so that on advancing further east, if the bed-rock should continue its present aspect, we shall have much over 100 ft. of gravel bank; the character of the gravel is heavier than anything hitherto met with, and has an encouraging appearance, especially near the bed-rock, where we have some feet of blue gravel soft enough to pipe, and showing gold; even should the ground prove no richer than that which we have already worked off in the mine, the extensive face now exposed will give us a chance for continuing washing, which will be of enormous advantage to us.

Grade: Our object now will be to preserve every inch of grade available, so as to run our sluice into the banks as low as possible. There will be much heavy work to do to carry out this purpose, as the bed rock is rather flat, and though as yet tolerably soft may become much harder as we go down in it. This work, however, will not materially affect our running, as it will be carried on contemporaneously as far as possible.—Revolution: A general civil war appears to be on the point of breaking out after over 10 years of quiet. I do not anticipate that our interests will be affected in any way. By the use of a little tact, and a knowledge of the people and country, foreigners can generally escape any molestation or loss.

MALPASO.—W. S. Welton, August 9: Run No. 27: Since run No. 26, from June 4 to July 31, the 58 days have been expended as follows:—Re-grading lower sluice, putting in 260 ft. of new sluice at head of former sluice, making new bulkhead and changing pipe to same, blocking and rocking entire length of sluice, and re-grading same, 30 days; days run, at an average of 19·59 hours per day, 27 days; cleaning up, 1 day: total, 58 days. Produce obtained from upper boxes of sluices, 359·60 ozs. gold, valued at $6653·60 (telegram of the result of this run was received in London on August 23), showing produce per hour for the total hours run, $12·68. Average inches of water used, 500.

This run is undoubtedly the best that has ever been made at Malpaso, and the gravel not prospecting any richer than before. I can only account for the increased produce by the improved condition of the sluice, and having got this much nearer to the bank, so that a large portion of the gold instead of being left on the rough bed of gravel, forming our base of operations or bed rock as formerly, now gets carried into the sluice. The distributer of wood I find answers perfectly well, and I have the two monitors placed in position, and shall continue sluice upwards in two branches, carrying a wide face, and working the monitors alternately, and cutting down the general sluices as we go on without loss of time. In this manner I hope to run continuously, working on one branch of the sluice while I clean up the other branch. Last run produced $340 per day's run, so that the importance of continuous running is very great.

NEW ZEALAND KAPANGA.—James Thomas, July 29: Since my last report I am pleased to say the water in the old workings has been successfully drained dry without hindrance or accident. After the water was completely drained I drove on the cross-cut, and cut the lode where it was discovered by boring, as explained in my last. I have now the pleasure of informing you that we cut through the lode in solid ground a little south, and a few feet from the bottom of the old winze under No. 4 level of the old mine. The lode is from 2 to 3 ft. wide, of solid compact quartz, mixed with mundic, clinging to the hard, well defined hanging-wall; the footwall carries a tough black flookan, full of fine mundic, 4 to 6 in. wide, which is a good indication, and is a great advantage for driving. As yet I have only had time to barely cut through the lode, and hole into the winze; in doing so we have met with occasional rich blotches and veins of coarse specimens of gold quartz sticking to the hanging wall. When breaking through the greenish lodestuff occasional spots of gold are to be seen in the quartz. The men are now employed cutting a plat at the point of intersection to drive north and south on the course of the lode; a little ground north of the winze appears to be stoped away. The prospects already obtained are very encouraging; the first day the lode was seen, and the first stones of quartz broken out were good specimens of gold; I post by this mail samples of the same. From the appearance of about 10 tons of lodestuff yet broken I should think it would yield 1 oz. gold per ton of stuff; it is, however, almost impossible to estimate the yield accurately until some 100 tons are put through the battery for a general test. I am unable yet to get through the bottom levels of the old mine, in consequence of mud being deposited in the levels 4 and 5 ft. deep, which will soon get dry enough to be removed if necessary. My main object at present is to push on driving north and south to open the lode for stoping away: this work I am doing as fast as possible. The machinery and pitwork are working splendidly. All operations underground and at surface are proceeding satisfactorily. By the next mail I hope to give you more particulars than I can do by this.

LUSITANIAN.—Sept. 5: Palhal: At Taylor's engine-shaft the men have been repairing the skip road after a breakage, and sending down work for the new plunger at the 190, which is not yet at work, owing to a scarcity of water. In the 110 cross cut, east of River shaft, we think we have the lode, but it is small, and so far poor. In the 50 cross-cut, north of Perez shaft, the ground is still hard, and we have not yet any lode. Basto's lode in the rise above the 90, east of River shaft, is yielding ½ ton of ore per fathom, and in the winze coming down on this rise from the 70 the lode is also worth ½ ton per fathom. The winze No 101 below the 160, west of Taylor's on Basto's lode, is holed to the 170, and the men put to stope in that level east of the winze.—Levels on Basto's lode: In the 190, west of Taylor's, the lode is rather improved in appearance, and has a little ore in it. In the 180 the lode on the north side is poor, but on the south side there is a small branch of ore on which we shall drive a metre or two.

The lode in the 170 is 3 ft. wide, of quartz, and in the 150, east of River shaft, the lode is of the same size, yielding stones of ore. In the 150, west of the slide, the lode is very small and unproductive. The end of the 90, east of River shaft, is poor, and has been suspended; the men are put to rise in the back. The lode in the 70 contains spots of lead ore; the men from here are now employed in sinking a winze to meet the rise above the 90. The lode in the 50, east of River shaft, is 2 to 3 ft. wide, composed of quartz and stones of ore. In the 28 east the lode is much mixed with schist, and gives stones of ore at times. At Carvalhal the lode in the 60, west of the cross-cut, is nearly 1 ft. wide, composed entirely of quartz, and in the 30, north of the great lode, on a north and south lode, west of the incline shaft, the lode is 6 in. wide, composed of quartz, schist, and mundic, with small stones of blende and spots of lead.

PANULCILLO (Copper).—F. G. Welch, Aug. 2: I beg to hand you a few remarks relating to the condition of drivages, &c., at the mines to date. My next report, giving a review of the operations for the past half year, will enter more fully into particulars of all the work at Panulcillo Alto.—Asuncion: In the 60 metre level south to lie improving, now to value.—Mina Vieja: There is little or no change to report in any of the drivages except those on the 85 metre level, which show great improvement at this mine. The new south stope is being opened out as rapidly as possible, and night corps now working to expedite matters.—Socavon Nuevo: Communication is effected between the 100 metre level cross-cut and Comunes perpendicular shaft. The men are cutting trip and tank plat. The water in Comunes underlay shaft is down 13 metres from the brace; five pumps working 24 hours are now making some headway on the water. The other "labores" show no change.—Cerro Negro: The various tribute-pitches at this mine still look favourable. The production at this mine for the past month amounts to about 3000 quintals metrico at 7½ per cent.—Panulcillo: The production at these mines amounts to 10,000 quintal metrico at 5 per cent.

SAN PEDRO.—Aug. 1: The following report was received Sept. 13: The 150 fm. level end, driving south of west, being still without change we have suspended the driving of this end for the present; two of the men formerly employed here are now driving an end south of east in the poor branch in hopes of meeting with better quality ore. The 122 fm. level end, driving south of west, round the old workings, is still producing stones of good ore; I have changed the direction of this end to west of north through the run of old works, hoping to meet with the ore ground said to be left standing when the works crushed in at this level, which I am assured is near where we are now working. The stope in back of the 88 is not so hard or so solid as when I last reported. As we are now so near the old works the ore ground is much crushed, therefore it is spare for stoping; it will produce 6 tons of 20 per cent. ore per fathom. The stope in the bottom of this level is also in soft and crushed ground behind old timbers: as the sides are getting very heavy we shall not be able to sink very much deeper. I have, therefore, started an end 20 metres below, from the footway chiffon, to get in under this stope in (say) 25 to 26 metres, according as we are able to drive through the old run; this stope will now produce 3 tons of 25 per cent. ore per fathom. Although these stopes have slightly fallen off in value we shall be able to raise as much ore this month as we did last, because as the ground is much softer we can break it with greater ease. In the 47 fm. level a chiffon sinking by the side of old works will produce 1½ ton of 23 per cent. ore per fathom. The cross-cut driving towards Cuba is without change.—Cuba Mine: The chiffon sinking below the adit, by five men, is without change since last report. The value of the metal sold at the end of June was $10,997·25. I estimate from this that the output of April was $3240; for May, $3540; and for June, $4000. I estimate the output for July at $3600, and I hope this month (August) it will again reach $4000.

PESTARENA UNITED (Gold).—Sept. 7: District Val Topps: The end north and south from the 3rd cross cut, on the western part of the great quartz lode, was driven in the past month 3·90 metres: the lode in the north end is small, and the end is now suspended. The end southward yields about 1 ton of ore per fathom, worth per small mill trial 2 ozs. 5 dwts. 2 grs. of sponge gold per ton. The lead of the shoot of ore driven through in the level below is yet before this south end, and we may look forward to an important improvement in the size of the lode. The Intermediate level, below Zero, on this western lode, was driven during August 2·30 metres; the lode is producing 12 tons per fathom, and estimated to be worth 15 dwts. per ton. The new stope in the bottom, behind this end, yields 11 tons per fathom, at 12 dwts. per ton. The sink north of the winze, on this lode, is producing 6 tons of ore per fathom, and worth about 10 dwts. per ton.—Great Quartz Lode: The stopes in the side of the drive, in the north end of the ground, above No. 3 level, yield 12 tons of ore per fathom, and worth 7 dwts. per ton. The drive south of the rise, behind the north end of the ground, advanced 3·50 metres; the lode is producing 9 tons per fathom, at 7 dwts. per ton. The stope in the bottom of No. 2 level, on this lode, yields 12 tons per fathom, at 7 dwts. per ton. The end of the new drive, on the eastern part of the great quartz lode, south of the 4th cross-cut, in No. 2 level, advanced in the past month 1·75 metres; lode 8 feet wide, of quartz as yet, of low quality.—Flat and New Lodes: The drive north from stope under No. 2 level, and south of 4th cross-cut, was extended 1·75 metres; lode producing 8 tons per fathom, worth 12 dwts. per ton; and the drive south, at the same place, 2·80 metres, on a lode worth 8 tons of 12 dwt. ore per fm. The rise in Intermediate drive, south of winze, under No. 2, on the junction of the flat and new lodes, is communicated to the old sink, and the four men are now engaged in taking down a part of the lode standing in the western side, which is picking stuff. The stopes inside of Intermediate drive, north of the winze, on the turn of the flat lode, are yielding 10 tons per fathom, at 10 dwts. per ton.—Lode and Branches End of New Lode: The stopes in the back, south of the 4th cross-cut, are now producing 7 tons per fathom, at 10 dwts. per ton. No. 3 level, south from the 14 cross-cut east, on a branch of new lode, advanced in the past month 2·4 metres; the lode is yielding 5 tons per fathom, and worth 7 dwts. per ton. The end south from this cross cut, on the eastern part of the great quartz lode, was driven about 1 metre; the lode is producing about 2 tons per fathom, at 5 dwts. per ton. Of late we have met with a few more miners, and have resumed the driving of No. 3 level south in the mountain, on the great quartz lode; we hope also to resume during this month driving the end of the old Zero level on discoveries.

District of Pestarena: The 33 end north, on No. 2 lode, was driven 3·25 metres; lode small, yielding occasional stones of ore. The stope in the back of this level, north of new cross cut, is suspended for the present month, and we have resumed an old stope a little to the south. The lode is small to commence with, but we hope to be able to raise some ore from this stope before the close of the present month. No. 2 stope, in the back of the 33 level, on the No. 2 lode, was stoped 19·18 metres; lode yielding 4 tons of ore per fathom, worth per small mill trial made 1½ oz. per ton. The stope in the bottom of this level, measured last month 9·91 metres; lode yielding 2 tons of ore per fathom, worth 1 oz. 14 dwts. per ton. The stope in the back of the 55, north of new incline shaft, was worked to the extent of 16·40 metres; lode yielding 5 tons per fathom, worth as per small mill trial 18 dwts. per ton. The 55 end north has advanced 2·45 metres, and has been suspended. We have now started a cross-cut eastward to communicate to the winze sinking from the 85 in Acquavita department, and have already driven 4·10 metres. Stope in north end of ground at 80 measured last month 12·90 metres; the lode yields 6 tons of ore per fathom; and a small mill trial of the ore shown to be worth 1 oz. 7 dwts. of gold per ton. The 65 cross-cut westward is being pushed on by six men. The new incline shaft was sunk last month 7 ft.; the lode is 6 ft. wide, worth 8 tons per fathom, producing, as per last mill trial, 1 oz. 14 dwts. of sponge gold per ton. The shaftmen are now employed placing a collar to commence driving on the lode at the 90, and during the present month we shall start two ends north and south of the shaft on a lode that will yield about 8 tons of ore to the fathom; this will help us.—Acquavite Mine: The stopes in the back of the deep adit produce 6 tons of ore per fathom, worth 8 dwts. 8 grs. per ton. No. 1 stope, in back of 23 level, yields 2½ tons of ore per fathom, at 11 dwts. 14 grs. per ton of ore. No. 2 stope, in back of same level, yields 2 tons, at 13 dwts. per ton. Pair progress is being made in the new adit. During the present month we intend stopping the pumps in Peschiera for a short time, to replace one of the old drums by a new one.

[For remainder of Foreign Mines, see to-day's Journal.]

CHINA CLAY AND ARSENIC.—A satisfactory amount of business may be reported in china clay, which moves off freely at late rates.—China clay: Superior, 12*s.* to 15*s.* f.o.b. Cornwall; "R sexallys" 24*s.*; "BM," 34*s.*—Arsenic: 10*l.* 10*s.*—*West Briton.*

HOLLOWAY'S PILLS.—With the advance of autumn the mornings and evenings become chilly, stop the late free action of the skin, and give rise to disorders of the lungs, liver, or bowels. Under such circumstances preventatives should be looked to as well as cure. The first symptoms of cough, disturbed stomach, or deranged bowels should be removed by judicious doses of these pills, the very best alteratives, which act with certainty and success on any organ in which faulty action exists, whether it be perceptible or unknown. Acting as gentle aperients, Holloway's pills strengthen the whole system, increase the appetite, improve the digestion, regulate the bowels, exhilirate the spirits, and expedite the circulation of pure and healthy blood.

HALF-YEARLY FOREIGN & COLONIAL MINING SHARE-LIST,

JANUARY TO JUNE, 1876.

SHOWING THE PRICES OF THE LONDON MARKET ON THE 1ST JANUARY AND THE 30TH JUNE, 1876, AND THE LOWEST AND HIGHEST PRICE FOR THE SIX MONTHS JANUARY TO JUNE, INCLUSIVE.

CONTRIBUTED BY **Mr. EDWARD ASHMEAD**, LONDON MINING AGENT AND ACCOUNTANT, 62, CORNHILL, LONDON, E.C.

EMBRACING THOSE MINES IN WHICH DURING THE PAST SIX MONTHS THERE HAVE BEEN FREQUENT DEALINGS AND CONSTANT QUOTATIONS, AND NOT THOSE IN WHICH THERE HAVE BEEN BUT FEW TRANSACTIONS AT LONG INTERVALS. SHARES HAVING THEIR TRANSACTIONS EXCLUSIVELY IN PROVINCIAL MARKETS WILL NOT BE FOUND IN THIS LIST.

MINE AND DISTRICT.	Mineral.	Shares.	Paid.	Price. Jan. 1, 1876.		January. Lowest.	January. Highest.	February. Lowest.	February. Highest.	March. Lowest.	March. Highest.	April. Lowest.	April. Highest.	May. Lowest.	May. Highest.	June. Lowest.	June. Highest.	Price. June 30, 1876.	
			£.	£.		£.	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.	£.	
FRANCE.																			
Pontgibaud	Silver-lead	10,000	20	18	to 20	17	20	18	20	17	20	17	19	17	19	16	19	16	to 18
ITALY.																			
Pestarena	Gold	80,000	3	1s 3d	3s 9d	1s. 3d.	3s. 9d.	1s. 3d.	3s. 9d.	1s. 3d.	⅜	⅛	½	⅛	⅛	⅛	⅛	⅛	⅛
RUSSIA.																			
Russia Copper	Copper	30,000	10	2⅜	3⅛	2⅜	3⅛	2⅜	3⅛	2½	3¼	2½	3¼	2½	3¼	2½	3	2½	3
SPAIN.																			
Alamillos	Lead	35,000	2	1½	2	1½	2¼	1⅝	2¼	1⅝	2½	1⅝	3	2	3	1⅝	2½	1⅝	2⅛
Fortuna	ditto	25,000	2	4½	5½	4¾	5½	5⅛	5½	4¾	6	4¾	6	5½	6	5½	6½	5⅝	6
Linares	ditto	15,000	3	3¾	4¼	3¾	4¼	4⅛	5	4½	6	4⅜	6	5⅛	6	5½	6	5⅛	6
Rio Tinto	Copper	225,000	10	6	6½	5	7	5	6	5	6½	4	5¾	5	6½	4½	6	4⅝	5⅛
do., 7 p. c. mortgage bonds	ditto	50,000	20	15	16	13½	16	12¼	15	13½	15	13	14½	13	15	13	15	13½	14½
do., 5 p. c. mortg. deben. / Spanish coupon bonds	ditto	£2,181,000	100	58	60	56	60	54	60	54	59	50	56	55	59	55	60	58	60
NEVADA.																			
Eberhardt and Aurora ...	Silver	27,528	10	8⅝	8⅞	7⅞	9½	7½	9⅛	6¾	8½	7	8	7⅛	8⅛	7⅛	9½	9	9⅛
Richmond	ditto	54,000	5	7½	7⅝	6¼	8	6	7½	5⅛	7¼	5¾	8	7	8½	7½	9½	8⅛	8½
South Aurora	ditto	60,000	5	¼	½	¼	¾	½	¾	¼	⅝	⅝	11s. 3d.	8s.	½	⅝	⅝	⅝	⅝
COLORADO.																			
Colorado Terrible	Silver-lead ...	21,000	5	1¾	2	1½	3½	1⅛	2⅛	1⅛	2	1½	2	1	1⅜	¾	1⅜	1⅛	1⅛
CALIFORNIA.																			
Birdseye Creek	Gold	15,000	4	2⅛	2⅛	2⅛	2⅛	2	2⅛	1⅛	2⅛	1⅝	2	1⅜	2	1⅜	2	⅝	⅝
Blue Tent	ditto	30,000	5	4	4¼	3¾	4⅛	4	4⅛	3	4¼	3	4	3	3⅛	3	3⅛	3	3⅛
Cedar Creek	ditto	40,000	5	⅛	⅛	⅜	1⅛	¾	1⅛	½	1	½	1	⅜	⅝	⅜	⅝	⅜	⅝
Exchequer	ditto	100,000	1	⅛	⅜	⅛	⅜	⅛	1⅛	1	2⅛	1⅛	3	1⅛	2⅛	1⅛	2⅛	1⅛	2⅛
I.X.L.	ditto	100,000	1	⅛	⅜	⅛	⅜	⅛	1⅛	⅛	1⅛	⅛	1⅛	⅛	⅜	⅛	1⅛	1	1⅛
London and California ...	ditto	65,000	2	⅛	⅜	⅛	⅜	⅛	⅜	⅛	⅜	⅛	⅜	⅛	⅜	⅛	⅜	⅛	⅜
Sierra Buttes	ditto	97,500	2	1	1⅛	1	1⅛	1	1⅛	1	1⅛	¾	1⅛	1	1⅛	¾	1⅛	¾	1⅛
do., Plumas Eureka, 1872.	ditto	140,625	2	1¼	1⅜	1	1⅜	1	1⅜	1¼	2	1¼	1⅜	1⅛	2¼	1	1⅜	1¼	1⅜
Sweetland Creek	ditto	15,000	4	2½	3	2½	3¼	2⅜	3⅛	2	3	1⅝	2⅜	1⅝	3⅛	⅜	2	½	1
OREGON.																			
Oregon, preference	Gold	3,000	4	4	4⅛	4	4½	4	4½	4	4¼	4	4⅛	4	4⅛	4	4⅛	4	4⅛
UTAH.																			
Chicago	Silver	15,000	10	6¼	6⅜	6	6⅜	5	6½	5	6	5	6	5½	6¼	5⅛	6⅛	6⅛	6⅛
Emma	Gold and silver ...	50,000	20	1	1¼	1	3	2	3	1	2⅝	1⅜	1⅞	1	1⅜	⅝	1⅛	⅝	⅞
Flagstaff	Silver	20,000	10	⅜	1	⅜	1⅜	1	2⅛	1	2⅛	1⅛	2⅛	1⅛	3	1⅛	2⅛	1⅛	2
Last Chance	ditto	20,000	5	⅛	⅜	⅛	⅜	⅛	1⅛	⅜	1⅛	⅛	1⅛	⅛	⅜	⅛	⅜	⅛	⅜
Tecoma	ditto	30,000	10	⅛	1	⅛	1⅜	1	1⅜	⅛	1¼	⅛	¾	⅛	½	⅛	½	⅛	½
MEXICO.																			
Almada and Tirito ...	Silver	60,000 / 70,000	1	½	¾	⅜	¾	¼	⅜	⅛	⅜	⅛	⅜	⅛	½	⅛	½	¼	½
United Mexican	ditto	43,174	28¾	3½	4	3¼	4¼	2¾	3¾	2	3½	2⅛	3	1¾	2¾	1½	2⅛	1⅞	2⅛
NICARAGUA.																			
Chontales	Gold	52,435	2	½	⅝	½	⅝	⅜	⅝	⅛	½	¼	½	6s. 3d.	⅝	6s.	12s. 6d.	⅝	½
Javali	ditto	30,000	2	½	⅝	½	⅝	⅜	⅝	8s.	11s.	¼	½	6s.	8s.	½	8s. 6d.	6s.	8s.
VENEZUELA.																			
New Quebrada	Copper	66,000	5	4	4¼	3¾	4¼	3½	4½	3	4	3	4	3	4	3½	4½	3½	4
NEW GRANADA.																			
Frontino and Bolivia ...	Gold	55,000	2	1⅜	1⅝	1½	2½	2	2¾	1¾	2⅛	1⅞	2⅛	1⅝	2⅜	1⅝	2⅛	1⅞	2⅛
BRAZIL.																			
Don Pedro North del Rey ...	Gold	100,000	16s.	3s 6d	8s 6d	3s. 6d.	½	3s. 6d.	⅛	6s.	⅛	4s. 3d.	11s.	3s. 9d.	⅜	1s. 3d.	⅛	1s 3d	3s 9d
Rosea Grande	ditto	15,000	1	—	—	—	—	¼	⅜	⅛	⅜	1s.	4s. 3d.	1s.	3s. 9d.	1s.	¼	1s.	2s 6d
Santa Barbara	ditto	40,000	10s.	1⅜	1⅝	1⅜	1¾	1½	1⅝	1⅜	1⅝	1⅜	1¾	2	1½	2	1⅝	1⅝	1⅞
St. John del Rey	ditto	£253,000	Stock.	380	400	360	400	365	400	365	405	350	400	330	380	330	380	335	355
CHILI.																			
Condes of Chili	Silver	16,000	5	—		5⅜	6	6½	7⅛	6½	7⅛	6	7	6	6⅜	6	6½	6	6⅛
Panuncillo	Copper	50,000	4	1½	1⅝	1	1⅜	1	2⅛	1⅜	2⅛	1½	2⅛	1⅜	2⅛	1⅜	2⅛	1⅜	2⅛
San Pedro	ditto	25,000	2	2½	3	2⅛	5½	3⅜	5½	2	3⅜	2	3	1⅝	2⅛	1⅜	2	1⅜	1⅝
ARGENTINE REPUBLIC.																			
Argentine	Gold	12,000	5	6½	7	6½	7⅜	6½	7⅜	6⅜	7½	6	7½	6	6⅜	5½	6½	6	6⅛
AUSTRALIA.																			
Australian Mining	Copper	20,000	7⅜	1⅜	2⅛	1⅜	2⅛	1⅜	2⅛	1⅜	2⅛	1⅛	2⅛	1⅛	2	1⅛	2	1⅛	2
Port Phillip	Gold	100,000	1	⅝	⅞	⅝	1⅛	⅝	1	⅝	1⅛	⅝	1⅛	⅝	1⅛	⅝	1⅛	⅝	1⅛
Scottish Australian		120,000	1	1⅜	1⅝	1⅜	1⅝	1⅜	1⅝	1⅜	1⅝	1⅜	1⅝	1⅜	1⅝	1⅜	1⅝	1⅜	1⅝
do., new		80,000	5s.	¼	⅜	¼	⅜	¼	⅜	¼	⅜	¼	⅜	¼	⅜	¼	⅜	¼	⅜
Yorke Peninsula	Copper	75,000	1	¼	½	¼	½	¼	½	¼	½	¼	½	¼	½	¼	½	¼	½
do., preference	ditto	40,000	1	¼	1	¼	1⅛	¾	1⅛	¾	1⅛	¾	1⅛	¾	1⅛	¾	1	¾	1
NEW ZEALAND.																			
New Zealand Kapanga ...	Gold	16,000	5	¾	1¼	½	1¼	½	1	½	1	½	1	½	1	½	1	¼	1
SOUTH AFRICA.																			
Cape Copper	Copper	20,000	7	36	38	35	40	37	40	37	40	37	40	38	41	37	45	38	43

MANUFACTURE OF GAS.—The invention of Mr. HENRY HAWKINS, of Milford Haven, Pembrokeshire, has for its object the construction of automatic apparatus whereby the pressure exerted upon the retorts during the distillation of coal or other gas-making material may be reduced, and consists in attaching to the ordinary dip pipe just under the upper part of the hydraulic main another pipe of somewhat smaller diameter, curved so that its lower part shall be immersed in the liquor while its upper part or mouth stands considerably above the surface of the liquid in the hydraulic. To the under side of the hydraulic is fixed a fork, to which is pivotted at or near its centre an arm, weighted at one end and pivotted at its other extremity to a light sheet iron or metal cap or bell, which covers the mouth of the bent pipe before described, and descends sufficiently far into the liquid as to form an efficient seal. Fixed to the bell is a wire or light rod which descends and then returns upwards through a sealed tube to the outside of the hydraulic, thus forming an indicator. The action of the apparatus may be thus described:—The hydraulic being charged with liquid, and the ordinary dip and the bell-lever enticed being sealed, the gas as emitted from the coal will pass from the retort up the ascension, and from thence to the dip where it would ordinarily escape, but as a more easy passage is afforded by means of the curved pipe, the gas will pass along it to the cap or bell, and by its pressure will raise the said cap or bell, thus unsealing it and allowing a free exit into the hydraulic main, the indicator at the same time rising and showing that the apparatus is in action. When the retort is being charged the pressure will be removed from the cap or bell, and it will consequently fall into the liquid, thus sealing the passage from escape of gas or entry of air, the fall of the indicator clearly pointing to this as being effected. To ensure the proper action of the apparatus it will be necessary to seal the lower part of the dip to an extent in excess of the pressure required to lift the cap or bell, but should the curved pipe be accidentally stopped no danger need be feared, since the gas will escape from the bottom of the dip in the ordinary manner.

UTILISATION OF SPENT OXIDE OF IRON.—In the treatment of spent oxide of iron (preferably after the separation of the sulphur) with alkaline earths, which dissolves out the ferro-cyanogen as a soluable salt of the base employed, it is usual to acidify the resulting solution with hydrochloric acid, and then precipitate the Prussian blue by any of the well-known methods, but the product produced in this way is largely contaminated with free sulphur produced by the decomposition of the sulphide of the alkaline earth, formed by the action of the alkaline earth on the free sulphur existing in the spent oxide. In order to avoid this Mr. S. H. JOHNSON proceeds thus—The solution resulting from the treatment with the alkaline earth (lime for example) is submitted to the action of a current of carbonic acid gas which may be produced and passed through the solution by any of the methods usually employed, but I prefer to burn coke with air in a closed vessel, pumping the air into such vessel so as that a pipe from the vessel may conduct the products of combustion into the alkaline liquid, or the air pump may be connected with a flue from any adjoining furnace, and the flue gases after having been passed through water will answer the purpose, p ovided that the fuel employed is of a comparatively smokeless character. This treatment decomposes the sulphide of calcium, forming carbonate of lime, which precipitates along with the sulphur. When the point of neutralisation has been carefully attained the liquid is allowed to remain at rest for some time, and then the clear solution of ferro-cyanide of calcium free from the sulphi ie is drawn of into the precipitating vat for the precipitation of the blue in the usual manner.

IRON AND STEEL EXPORTED.—In the last seven months the declared value of iron and steel exported was 11,848,559*l.*, against 15,498,812*l.* in the same period of 1875.

TREFRIW—SUDDEN DEATH.—We are sorry to announce the death of Mr. WM. OWEN, Bryn Hyfryd, Trefriw, Carnarvonshire, so well known in mining and quarrying circles as the respected inspector of the Gwyder Estate for nearly a quarter of a century, under Lord and Lady Willoughby de Eresby. This mournful event occurred on Sept. 6. He left his house in the morning, not feeling as well as usually, but, as always the case with him during his long and efficient mining career, firmly determined to perform his duties. The sequel, we are sorry to relate, when he arrived at Cae Rwyn, a distance of 1½ mile, he had a fit, and died instantaneously from disease of the heart. Thus terminated the useful life of this esteemed man in the 57th year of his age. His steady and straightforward conduct had gained for him friends among rich and poor, as was shown, his funeral being one of the largest ever seen in the locality. As a practical geologist he was eminent, as a neighbour he was kind and affable, and as an inspector of mines and quarries he walked in the highest rank. It is no wonder that the death of one so respected and beloved in life should cast a gloom over the whole county.

FOREIGN MINING AND METALLURGY.

During the last few days there has been no sensible amelioration in the Belgian coal trade. This is principally a season of preparation for the wants involved by the approach of winter. The principal clients of the Belgian collieries at present are the sugar manufactories and the distilleries. In passing through Belgium one may observe that these establishments are everywhere receiving and warehousing their coal; but metallurgical industry still maintains an attitude of reserve, and is only laying in supplies from day to day. Prices are maintained with more firmness, but for important contracts, which are unfortunately very scarce, producers would be ready to make some concessions. It appears from official returns that the imports of coal into Belgium in the first seven months of this year amounted to 428,000 tons, against 375,000 tons in the corresponding period of 1875, and 202,000 tons in the corresponding period of 1874. The imports have thus more than doubled during the last two years. Of the 428,000 tons imported to July 31 this year England alone supplied 209,000 tons. Coke was imported into Belgium during the first seven months of this year to the extent of 15,000 tons, against 900 tons in the corresponding period of 1875, and 4000 tons in the corresponding period of 1874. The exports of coal from Belgium have not materially varied; in the first seven months of this year they amounted to 2,108,000 tons, against 2,278,000 tons in the corresponding period of 1875. Of the coal exported from Belgium to July 31 this year 2,021,000 tons went to France. Coke was exported from Belgium in the first seven months of this year to the extent of 345,000 tons, against 412,000 tons in the corresponding period of 1875. M. Laguesse, director of mines in the Hainaut, has reported on the coal production of that province in 1875. It appears that last year the mines of the Hainaut produced 11,000,000 tons, of an average value of 13s. per ton. In 1865 this production was only 9,000,000 tons, of an average value of 8s. 8d. per ton. The collieries of the Hainaut employed last year 80,689 working miners, or 554 more than in 1874. The annual average wages paid were 47*l.* 3s. per man, or 12s. 9d. per man less than in 1874. The cost price of the coal produced in the Hainaut last year was 11s. 10d. per ton, or 2¾d. per ton less than in 1874. The selling price last year was 13s. per ton, or 8¾d. per ton less than in 1874. Last year 52 mines were worked at a profit in the Hainaut, against 60 in 1874; 36 were worked at a loss, against 29 in 1874.

Copper has continued quiet upon the Paris market, and there are at present no symptoms of a revival. Quotations have, nevertheless, been supported with tolerable firmness. Chilian in bars had made 77*l.* 10s.; ditto ordinary descriptions, 75*l.* 10s.; ditto in ingots, 79*l.*; English tough cake, 78*l.*; and pure Corocoro minerals, 76*l.* per ton. Copper has slightly improved upon the Marseilles market. In Germany transactions in copper have been comparatively limited, and prices have not varied. The Rotterdam tin market has been weak, and prices have given way, Banca having fallen from 43 fls. to 42½ fls. The Dutch Society of Commerce has announced a sale for the 26th inst. This sale will comprise 29,900 ingots of Banca, of which 6700 blocks are deposited at Rotterdam, 22,600 blocks at Amsterdam, and 600 blocks at Dordrecht. Transactions have taken place in Billiton at 42 fls., with delivery in November. There has been little business doing in tin at Paris, and prices have remained without any great variations. Banca delivered at Havre or Paris has made 78*l.*; Straits, ditto, 77*l.*; and English, delivered at Havre or Rouen, 77*l.* per ton. There has been little change upon the German tin markets. French, Spanish, and English lead have made 21*l.* 12s. per ton at Paris. Belgian and German have brought 21*l.* 16s. per ton. There has been little business doing at Paris, but the article has remained firm. Silesian zinc, delivered at Havre, has brought 24*l.* per ton; and other good marks, delivered at Havre or Paris, 23*l.* 16s. per ton. The German zinc markets have been firm, but there has not been much business passing upon them.

There is an almost general improvement in the French coal trade. Stocks are being almost everywhere reduced—in the Nord, in the Pas-de-Calais, and in the basin of the Loire—and Paris has been laying in what the French term "serious" supplies. German coal owners are making great efforts to introduce the coal of the Ruhr basin into France, but it is found that the low rates at which offers are made to deliver it are negatived to some extent by the quality of the coal offered. Belgian and English coal is beginning to arrive in France upon a considerable scale. Prices remain much the same, with, however, a slight upward tendency. With reference to the project for making Paris a port, it may be observed that the Commercial Council of Havre has voted 20,000*l.* for works for improving the navigation of the Seine. The extraction of coal in the department of the Pas-de-Calais in 1875 is officially returned at 3,257,510 tons, as compared with 2,973,789 tons in 1874, 2,983,590 tons in 1873, and 2,639,573 tons in 1872. The demand for coal was pretty well sustained in the Pas-de-Calais last year, but prices materially declined during the 12 months in sympathy with the fall in other districts.

There are complaints in the principal French metallurgical centres that the revival so much talked of developes itself very slowly. Paris, that great centre of affairs, is alone favoured. The Municipal Council of Paris is actively pushing forward the expropriation of the property required in connection with the piercing of certain new streets which have been decided on in the French capital. This circumstance is expected to have a favourable influence upon the French iron trade, as when building industry goes well all goes well. Rolled coke-made iron is quoted at 8*l.* per ton first-class, with a margin of 8s. per ton per class. Mixed rolled iron is quoted at 9*l.* 8s. per ton, and first-class rolled charcoal-made iron at 10*l.* 12s. to 10*l.* 16s. per ton, with a margin of 8s. per ton per class. In the Haute-Marne iron wire and sheets are in pretty good demand, but the foundries have little work. The Nord suffers more. First-class iron from coke-made pig is quoted at 7*l.* to 7*l.* 4s. per ton, with a margin of 8s. per ton per class. Mixed rolled iron, first-class, has brought 7*l.* 12s. per ton, with a margin of 8s. per ton per class. The Loire Mines Company will pay October 16 an interim dividend for 1876 of 5s. per share.

Orders continue to arrive at the Belgian ironworks. The rolling-mills have for some time been especially occupied with the production of iron for building purposes. Many buildings are in course of execution in the great towns of Belgium, and as winter is coming on working operations are being accelerated, hence an unusual flow of orders for building iron. The iron merchants, anticipating a slight advance in prices, are laying in supplies at present. Enquiries are also being received as to plates, the demand has become more active, and, upon the whole, the situation is better. The annual meeting of the Athus Blast-Furnaces Company has been held this week; the profits realised in 1875-76 amounted to 13,569*l.*, notwithstanding the continuous fall in the price of pig. The council of administration is taking measures for reducing the cost price of pig, and increasing the production of the company's blast-furnaces. The company is about to raise 40,000*l.* of additional share capital, with the view of purchasing certain mineral lands, and building a third blast-furnace. The council of administration has also been authorised to issue obligations to the extent of 40,000*l.* The dividend for the year 1875-6 has been fixed at 8 per cent. per annum. A concession of 4 2-8ths miles of tramways at Madrid has been granted to a newly-formed company; the rails are to be of steal. The imports of iron minerals into Belgium in the first seven months of this year were 414,000 tons, as compared with 510,000 tons in the corresponding period of 1875, and 422,000 tons in the corresponding period of 1874. The imports of rough pig and old iron into Belgium amounted in the first seven months of this year to 123,000 tons, against 86,000 tons in the corresponding period of 1875, and 88,000 tons in the corresponding period of the year 1874. The imports of manufactured iron into Belgium have fallen off this year, having declined to 7700 tons, against 9000 tons in the corresponding period of 1875, and 18,600 tons in the corresponding period of the year 1874. The exports of iron minerals and limailles from Belgium in the first seven months of this year amounted to 86,000 tons, against 92,000 tons in corresponding period of 1875, and 54,000 tons in the corresponding period of 1874. The exports of rough pig and old iron from Belgium in the first seven months of this year amounted to 6000 tons, against 8000 tons in the corresponding period of 1875, and 10,000 tons in the corresponding period of 1874. The exports of manufactured iron—chains, anchors, plates, wire, &c.—from Belgium amounted in the first seven months of this year to 116,000 tons, against 120,000 tons in the corresponding period of 1875, and 148,000 tons in the corresponding period of 1874. It appears from an official report that the province of Hainaut produced last year 51,000 tons of casting pig and 242,000 tons of refining pig. The Upper Hesse Railway Company is about to let a contract for 9 miles of steel rails.

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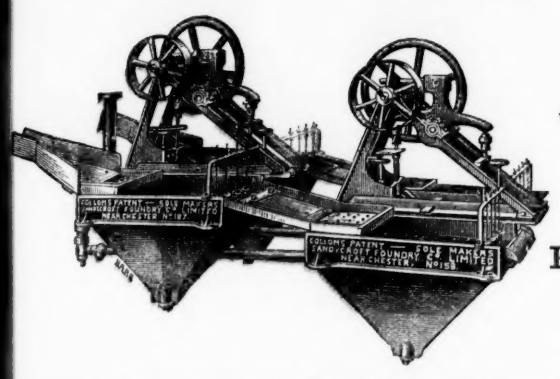

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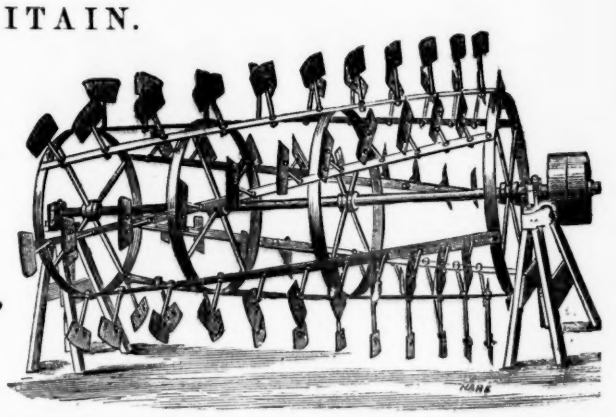

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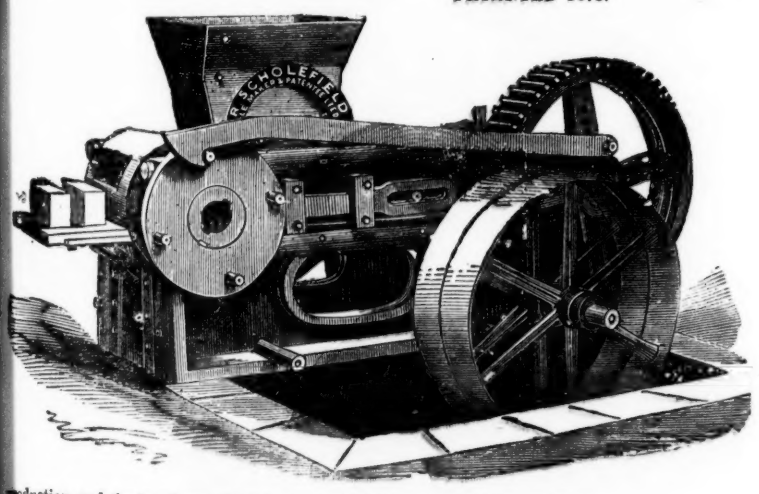

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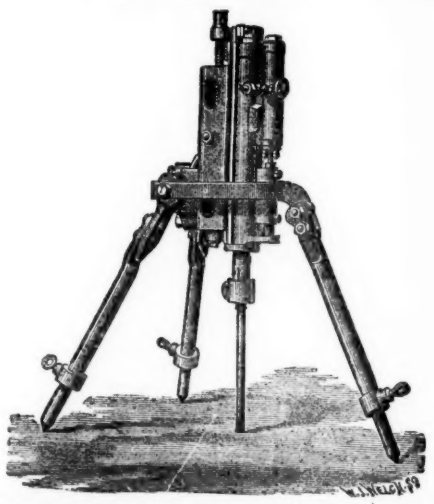

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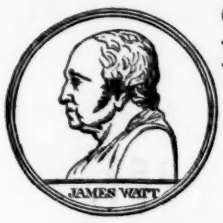

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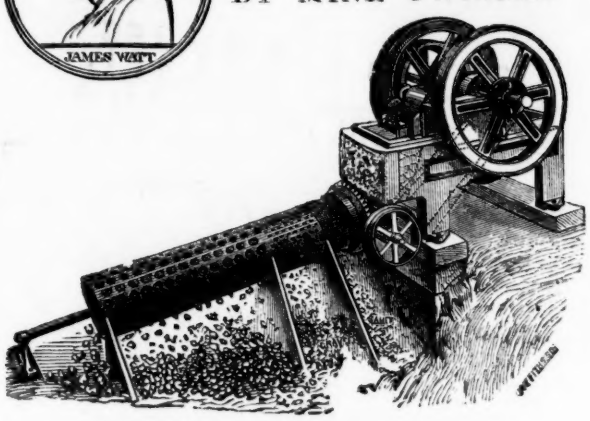

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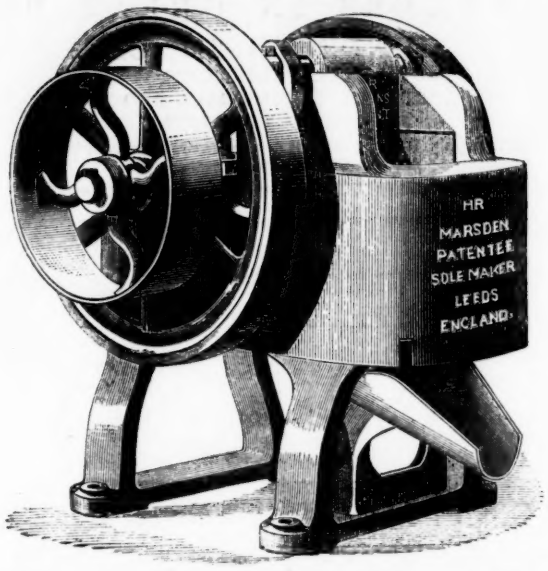

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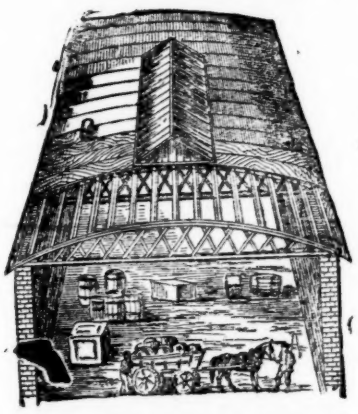

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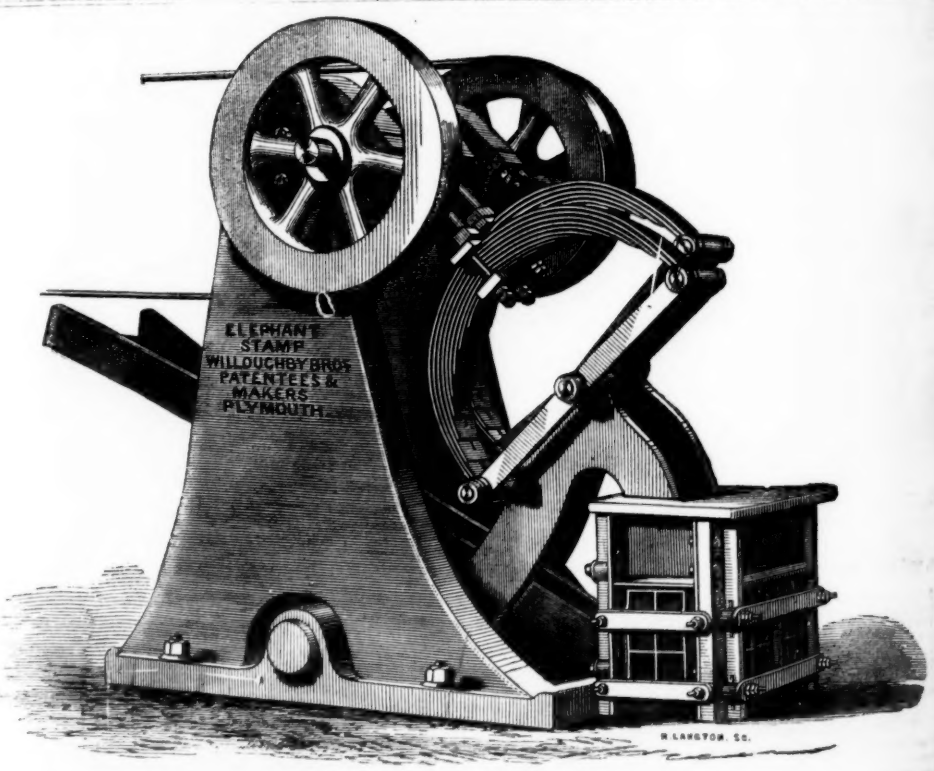

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